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Current Anthropology

A WORLD JOURNAL OF THE SCIENCES OF MAN

A CROSS-CULTURAL OUTLINE OF EDUCATION *by Jules Henry*, 267

HUMAN ECOLOGY DURING PLEISTOCENE AND LATER TIMES IN AFRICA SOUTH OF THE SAHARA *by J. Desmond Clark*, 307

THE USE OF SHERD WEIGHTS AND COUNTS IN THE HANDLING OF ARCHAEOLOGICAL DATA *by Wilhelm G. Solheim II*, 325

MORE ON LEXICOSTATISTICS, 338

CAN THE MOUNTAIN GORILLAS BE SAVED? *by Raymond A. Dart*, 330

Research Reports:
CURRENT FIELD STUDIES OF GORILLAS *by John T. Emlen, Jr.*, 332

Conferences: SOCIAL LIFE OF EARLY MAN, 332

Research Plans, 333 Serial Publications, 333

Wanted, 334 Terminology, 335

Future Meetings: TENTH PACIFIC SCIENCE CONGRESS, 335

Translations:
RUSSIAN ANTHROPOLOGICAL PUBLICATIONS ON NORTHERN EURASIA, 336

Institutions, 336: ANTHROPOLOGICAL INSTITUTIONS IN CRACOW, POLAND, 337

For Sale, 337 Free Materials, 337

OUR READERS WRITE, 265, 306, 346

SUPPLEMENTARY LIST OF ASSOCIATES, 347

CALENDAR, inside back cover

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CURRENT ANTHROPOLOGY est une revue de langue anglaise paraissant six fois par an. Elle s'adresse aux spécialistes du monde entier qui se consacrent aux disciplines anthropologiques (anthropologie sociale, culturelle et biologique), à la linguistique, à l'archeologie et à la préhistoire. Les membres associés de CURRENT ANTHROPOLOGY forment un groupe de spécialistes qui aspirent à un échange scientifique à l'échelle mondiale, et qui dans un esprit d'étroite collaboration, se communiquent mutuellement des informations et des idées par l'intermédiaire de cet organe. Les institutions associées de CURRENT ANTHROPOLOGY assument la même obligation. Les deux catégories d'Associés reçoivent la revue et payent seulement le 20% de l'abonnement parce que leurs activités entrainent pour eux des dépenses supplémentaires. Les étudiants d'anthropologie recommandés par les Associés obtiendront un abonnement à prix réduit (40% du tarif normal). Quiconque le désire peut s'abonner au tarif normal.

Historique du projet

Depuis sa fondation en 1941, la Wenner-Gren Foundation for Anthropological Research a reconnu l'importance des échanges internationaux dans le domaine des diverses sciences de l'homme. C'est ainsi qu'en 1952, la Wenner-Gren Foundation a accordé son patronage à un Symposium international d'anthropologie dont un des résultats a été la publication de *Anthropology Today, Appraisal of Anthropology Today* et l'*International Directory of Anthropological Institutions*. Faisant suite à ces ouvrages, un *Yearbook of Anthropology* a été publié en 1955 à titre expérimental. Une partie de cet ouvrage a été réédité sous le titre de *Current Anthropology* qui est devenu celui de la revue.

La présentation et le contenu de la revue CURRENT ANTHROPOLOGY ont été discutés dans des conférences ou par correspondance avec les spécialistes du monde entier. Au cours de la conférence de Burg Wartenstein (Autriche), centre européen de la Wenner-Gren Foundation, les principes genéraux suivants furent formulés:

1. La revue traitera de tous les problèmes intéressant les diverses disciplines anthropologiques et réunira des faits significatifs et des idées nouvelles afin de faciliter les échanges internationaux.
2. Elle visera à la synthèse.
3. Elle constituera pour les spécialistes un instrument de travail apte à leur fournir des informations sur les recherches en cours.

L'année suivante, grâce au concours de nos collègues, les principes prirent la forme du plan présenté ici.

Le Statut d'Associés

CURRENT ANTHROPOLOGY groupe à la fois des spécialistes et des institutions sans tenir compte des nationalités et des opinions politiques. En échange du tarif spécial qui leur est consenti on attend des Associés qu'ils présentent de nouveaux membres, qu'ils soumettent des articles et communiquent des informations susceptibles d'interesser les autres Associés. La rédaction compte également sur ceux-ci pour obtenir des commentaires sur des articles de fond.

Contenu

CURRENT ANTHROPOLOGY publie deux sortes de textes: d'une part des articles sur l'état actuel d'une question, de l'autre, des informations diverses et une documentation de base. La revue publiera forcément des articles qui auraient pu trouver place ailleurs. Néanmoins le cadre géographique très ample assigné aux articles et leur orientation théorique lui éviteront de faire double emploi avec d'autres revues. CURRENT ANTHROPOLOGY en tant qu'instrument d'échanges entre spécialistes répond à une formule originale.

Articles sur l'état actuel d'une question

Ces articles porteront sur des problèmes généraux et en donneront une vue d'ensemble. Il ne s'agira pas, à proprement parler, de synthèses de faits dûment établis, mais de présentations de données inédites, d'idées ou de théories en des domaines où une anthropologie en plein developpement témoigne d'une orientation nouvelle. Cependant pour neufs que seront les travaux présentés, on ne fera pas abstraction de ce qui est déjà connu. Les contributions à la revue consisteront tantôt en des réinterprétations des résultats de recherches antérieures tantôt en des examens critiques de l'ensemble de nos connaissances sur un point donné. Les limites que les auteurs s'assigneront seront fonction d'une période, d'une région géographique ou de tout autre critère. On demandera aux auteurs de formuler clairement les bases de leur argumentation ou de faire brièvement l'historique du thème qu'ils aborderont.

On ne craindra pas les grands sujets qui seront traités largement, sans pour autant négliger les explications de détail, les exemples concrets, et enfin les possibilités que reserve l'avenir. Chaque article comportera une abondante bibliographie. L'auteur qui, par définition, sera un spécialiste de la question, s'adressant à des collègues, s'efforcera d'être clair, surtout dans l'emploi de sa terminologie. L'article sera aussi long que le sujet l'exige, mais dans des limites raisonnable. Il y aura interêt à ce qu'ils soient illustrés.

Les articles envoyés à CURRENT ANTHROPOLOGY, une fois acceptés, seront copiés en plusieurs exemplaires et expédiés aux membres associés, spécialistes en la matière ou s'intéressant de façon particulière au sujet traité. Ceci represente la première réalisation concrète du type d'échanges qui constituent la raison d'être de notre revue. Bien que ces commentaires soient sollicités, ils seront considérés comme des "manuscrits" originaux et leur publication sera soumise à la décision du rédacteur.

Les commentateurs sont choisis sur la base des fiches, classées au bureau de la rédaction, et qui ayant été remplies par les Membres Associés eux-mêmes contiennent des indications sur les sujets de leur spécialité. Les spécialistes désignés peuvent aussi être recommandés par l'auteur de l'article. Par commentaires on entend soit des rectifications ou des adjonctions à l'usage de l'auteur qui les utilisera à sa guise, soit des discussions sur la méthode suivie ou sur les opinions présentées dans l'article. Dans ce dernier cas l'auteur pourra répondre s'il le souhaite. Toute note critique publiée dans la revue sera designée par un asterisque (☆) après le nom de l'auteur.

Un article sur l'état actuel d'une question devrait normalement comporter l'article lui-même, des commentaires précédés du nom de leur auteur et une réponse à ces commentaires. Après publication de l'article, la revue accepterait

Continué au verso intérieur

Our Readers Write

. . . This first number of CURRENT ANTHROPOLOGY is exactly what I expected a like publication should be. Though both review articles deal with subjects beyond my own field of research and therefore cannot be subject to any criticism or approval on my part as to the details of their contents, I think that the presentation (including discussion by other scholars of sometimes different views) is quite what could be expected by a "neighbour" who wishes to be informed on problems and work in neighbouring fields of general anthropology.

I think it is not the task of CA to publish reports on new excavations (as seems to be suggested by . . . Madame de Sonneville-Bordes [Jan., p. 2]), with the exception of finds which really throw light on questions basic for anthropology as a whole . . . (as the "Zinjanthropus") or of broad interdisciplinary interest . . . the Paleolithic should find its place in CA only as the subject of "review articles" or "news" and "references." Giving detailed reports on excavations (and analogous reports and descriptions of fossils, a newly discovered or recently visited people, an exotic language, etc.) would cause the danger of CA becoming what in Germany sometimes is called a "Buchbinder-synthese," a collection of special materials and particulars, the synthesis of which will rest with the bookbinder.

If one regards it as one of the tasks of CA to foster a new sense of unity among the different branches of anthropology, one should perhaps pay attention to the old experience that often the bystander sees more. I therefore heartily welcome the letter of G. D. Spindler [Jan., p. 1] expressing the wish to have non-anthropologists criticizing topical approaches in anthropology . . . I think this could meet with the demand of J. W. Bennett [Jan., p. 1] to deal with the revival of older ideas, even with those of classic and medieval philosophy.

KARL J. NARR

. . . This new means of communication is one of the finer things that is happening to anthropology today. . . . As to content, I would like to see a maximum number of short articles reviewing current developments in anthropology in all parts of the world (e.g., the Leakey article [Jan., p. 76]). This may limit the number of larger articles but is worth the sacrifice. Pages 76–80 [Jan.] are excellent and should be expanded. This to me is the meat of the matter.

ROBERT L. STEPHENSON

. . . The coverage of the anthropological field and the method by which the review articles were prepared [in the Jan. issue] surpassed my expectations.

WILLEM A. GROOTAERS

. . . Dell Hymes's article is the sort of synthesis and examination of problem and area that is extremely profitable for everyone.

S. W. MILES

I wish you every success in your admirable venture, but hope you will stick to the resolution, "no matter how technical the subject, an article should explain itself and be written in language that will be followed by scholars in other specialties. . . ."

SONIA COLE

Suggest that CURRENT ANTHROPOLOGY stress material and areas largely ignored by the *American Anthropologist*. Thus you would not only contribute greatly to anthropological knowledge but would have a wide field of activity largely free from competition. A second suggestion is that papers be written, where possible, in such a manner as to be of interest to all the Associates and understandable by most of them. In other words, papers should be less narrowly technical than those intended for specialized journals such as *Lingua*, *Journal of Genetics*, and the like. A third suggestion is to keep papers comparatively short but to include as many and as diverse papers as the issue permits. . . .

CARL B. COMPTON

. . . I think [CA] should facilitate very much our scientific work, which needs close collaboration and free exchange of opinions between the specialists in a given field of anthropology. It seems to me that CURRENT ANTHROPOLOGY will play its important role very well, judging on the basis of the first number, which I have read with the greatest interest.

ANDRZEJ WIERCIŃSKI

The March issue of CURRENT ANTHROPOLOGY has just arrived. . . . This thing is getting even better as it goes along. My heart is warmed by your results. . . .

LLOYD CABOT BRIGGS

. . . The second issue [is] very interesting. By all means publish both sides of arguments, as with Giddings' article.

CLIFFORD EVANS

. . . Though anthropologists are probably the least isolated of professional groups, an additional breakdown of international barriers, as represented by CA, is of tremendous value.

RODOLFO STAVENHAGEN

. . . This is the best idea in anthropology since Boas left physics to pursue the study of man in the 19th century.

HERBERT W. DICK

* * *

. . . I should like to call to your attention a book that appeared in 1959: *Einführung in die Urgeschichte* ["An Introduction to Prehistory"] by Hans Jürgen Eggers (Munich: R. Piper & Co.). This work is a textbook on the methods of prehistoric archeology. He presents the bases for the "chronology" better than anyone else, to my knowledge. I would like to advise you to have this book translated into English.

HANS GUMMEL

* * *

I should like to see . . . a request for a listing of all ethnographic contacts [that Associates and subscribers] have had for which they have unpublished field observations, no matter how brief, and for which they have published reports not generally available or widely known. I would then like to see CURRENT ANTHROPOLOGY publish the answers by Area and People (group or tribe). This should bring to light a mass of ethnographic data collected "in passing" by observers, whose primary purpose for being in the specific area was perhaps not ethnography. . . . This would not be a bibliography, but an indication that, "I have seen the X people and anyone who is now interested in them may contact me for I may know something they wish to know."

If the task is too great for CURRENT ANTHROPOLOGY to undertake itself, I suggest that someone *in* each areal division be nominated or volunteer to collect and tabulate the information and to forward it to CA for serial publication by area.

JANE C. GOODALE

Would a few special issues devoted to the anthropology *of* (not *in*) a particular country or area be of interest? I should think that such issues would sug-

gest areas of needed investigation, and might help in planning research projects so as to avoid complete duplication. Another pet project of mine: an occasional review of technical aids to the field anthropologist, such as that appearing in *Anthropology Today*—a "gadget corner," if you will.

I should also like to see a touchy subject discussed: What are the ethics of anthropological publication? Under what conditions is the anthropologist justified in suppressing data—should he place [it] in a vault and say, "I have supporting material but . . .": or are there other ways of protecting ourselves and informants? I think this becomes more and more of a problem as we work in "sensitive areas," politically speaking.

ROBERT J. MILLER

I like Dwight Heath's idea [March, p. 89] . . . of a bibliography with titles contributed by authors. Perhaps each issue could concentrate on various topics, so that every year or two years you would complete the round of topics and start over again. RICHARD N. ADAMS

. . . I would back the suggestions [March] of R. Carneiro [p. 84], A. Kortlandt [p. 87], D. B. Heath and H. Nachtigall [p. 88]. WOLFGANG RUDOLPH

Inter-disciplinary research by Pleistocene geologists and geographers in anthropology has by no means been uncommon, especially in establishing Palaeolithic chronologies, in cave stratigraphy, and, in recent years, in a number of joint archaeological-geological surveys or excavations. The importance of environmental reconstruction, of some kind of "Quaternary ecology" or a "prehistoric geography," has been recognized by a number of anthropologists. It would amount to a physical science with conscious application to archaeology, by no means a new field, but a different emphasis of materials and technique. The present status, the evolution and future of such interdisciplinary research deserves attention by CURRENT ANTHROPOLOGY. . . . I hope CA Associates will show sufficient interest that the subject can be presented as a review article. KARL W. BUTZER

It seems to me that the study of the soils, fossils, and relicts of Quaternary age should be emphasized, not only for solving paleoclimatic problems but also for better understanding of the first phases of agriculture.

FIORENZO MANCINI

We need a thorough, up-to-date review of the European Paleolithic, integrating recent discoveries, new methodologies, revisions in time scales with geological and archaeological correlations, and the latest interpretations in terms that would be significant to a general cultural anthropologist. KEITH A. DIXON

A summary of knowledge of Central American archaeology would be useful and an important basis for future work. Since the publication of the *Handbook of South American Indians* so many new discoveries have been made and new concepts introduced (e.g., the "Formative Phase" and the developmental stages, not to speak of others) that a re-appraisal and an up-to-date bibliography is needed. Perhaps bibliographies could be bound separately because of their size, and made available for a modest fee. A discussion of the different concepts of archaeological stages in the New World as well as the Old World would be difficult to write but rewarding to read. Another desideratum is a reference book of archaeological material; e.g., colors are described either according to individual impressions, or in half a dozen different reference books only one of which may be available to a particular student.

I strongly recommend the survey of Central American collections as mentioned by A. Kidder, II [March, p. 90]. I already have a certain amount of material, especially for El Salvador and Panama. Articles should be general, not too much specialized, especially not in regions. There is so much need of worldwide general themes and their discussion, that CA should leave special areas to special periodicals.

WOLFGANG HABERLAND

. . . One of the most felt needs is a catalog of archaeological materials on a regional, national, hemispheric, and world-wide basis. *Archaeology of the Eastern U.S.* did this, in great measure, for that area. There is nothing comparable for other regions of the U.S. In certain other regions, work has been adequate or above, as in Nicaragua and Costa Rica for pottery (Lothrop) or the Chiriqui area also for pottery (MacCurdy) . . . an archaeological encyclopedia would be a most worthwhile project for someone . . . [and] would form a solid and substantial foundation for future archaeological work as well as being an indispensable reference work.

CARL B. COMPTON

We in Europe who have not yet had the chance to visit the United States would like to know some facts about the different study centres in the universities of the States. E.g., which universities or institutes deal with African languages? Which African languages are preferred and why? Are there any special enterprises and plans for establishing a centre for African studies? A kind of short directory for "African students and studies in the States" is needed! HERRMANN JUNGRAITHMAYR

[I would like to see in CA] a comprehensive bibliography of African linguistics; names and addresses of foundations supporting linguistic research in Africa or publication of material; a list of American universities with African languages in their program.

JAN KNAPPERT

A recent review by Richard Pittioni in *Anthropologischer Anzeiger* reminds us that we often fail to keep up with the research of our colleagues on the continent. . . . My suggestion will be costly to implement and will require careful organization: a comprehensive (say trilingual) abstracts series on the same grand scale as *Psychological Abstracts*. Perhaps this in time could incorporate *African Abstracts*, *Abstracts of New World Archaeology*, and others.

JOHN J. HONIGMANN

. . . The people of the lands from Turkey (even from Yugoslavia) to India are suffering and fighting against hunger, though these areas are the cradle of agricultural science. . . . I would like to see more attention paid to the problems of these areas, and especially to the reaction of the people to economic development. The development is often seriously hampered by religious conservatism and animosities stemming from racial differences. Such obstacles are of fundamental importance in under-developed lands, and I would welcome discussion of the problem in the pages of CA. Research and information in particular areas and countries of the Middle East is scarce, and yet badly needed by those engaged in preparing development plans.

ORHAN YAMANLAR

Some years ago, while I was comparing certain Swedish and Japanese words that were strikingly similar in sound, I conceived the intuition that the human speech mechanism cannot emit any articulate sounds without some meaning in some living or dead language or dialect, ancient or modern.

In the confirmation of this theory, I anticipate the possibility of finding the existence of a psycho-physiological factor in the development of speech that may have an important bearing on the scientific study of language.

I hope that I may profit by comments on this matter from some experts in lexicostatistics and glottochronology.

ADOLFO DE HOSTOS

(Continued on page 306)

A Cross-Cultural Outline of Education

by Jules Henry

Introduction

THE NAMES of many anthropologists have become associated with the cross-cultural study of education. Pettitt (1946), Raum (1940), Mead (1939), and Spiro (1958) have devoted entire volumes to the subject. A short but enlightening work is that of Fortes on the *Social and Psychological Aspects of Education in Taleland* (1938). Volume 48 of the *American Journal of Sociology* (1943) contains several papers by anthropologists on education. A few anthropological monographs contain sections on education, though others make reference to the subject merely in passing. Recently, a review of problems in education appeared as a collaborative work of anthropologists and educators (Spindler 1955).

In surveying these publications, it seemed that it might be useful if a general outline of the educational process could be provided for the anthropological field worker. With such an outline, the scientist would not need to rely solely on his creative imagination and on works that are often incomplete and focused on particularistic interests, for he would have available also a methodological tool that might help increase the scope of his observations.

As industrial cultures become more and more the target of anthropological interest, anthropologists will sooner or later have to study their educational systems too, so that an outline of education for anthropologists should take account not only of pre-literate culture but of industrial society also.

Much material that one might wish to see included in an outline of education is concerned largely with personality, with physiological pathways to enculturation, and with the conditioning of the very young child while feeding, eliminating, or, in general, in close physical contact with his family. The present outline, however, deals primarily, though not exclusively, with children about six years of age and older, and concentrates on the formal, conscious aspects of education. Furthermore, since the outline and text are concerned solely with education as a social process, no attention is given to knowledge the child acquires while alone.

Education can be looked at from the standpoint of the adult educator and from that of the child who is learning. The adult generally wants to do something to the child, and sees education as a process through which the child should become what the adult wants him to be. From the position of the child, however, education is also finding a way to certainty: the child wants to know what he should do about everything, and how he should do it, and he looks to the adult—to the educational process—to help him. This outline and text take account only of the first view.

ORIGINS OF THE OUTLINE

While the outline derives in part from the work of others and in part from my own field experience in non-industrial cultures, much of it has grown out of research on cultural factors in learning that was begun seven years ago at Washington University. Several hundred protocols of direct observation of American classrooms have been collected by me and my students, and it was the analysis of these observations that made necessary the bulky (but by no means complete!) outline. The research continues (Henry 1955*a*, 1955*b*, 1957*a*, 1957*b*, 1959).

The records collected during this research are factual, relatively unscreened process notes of what the observer

JULES HENRY is Professor of Anthropology at Washington University (St. Louis, Missouri, U.S.A.). Born in 1904, he was educated at The College of the City of New York (B.S., 1928) and at Columbia University (Ph.D., 1936).

HENRY has long been concerned with the relation between culture and personality, and he developed his interest in education in connection with the problem of socialization. His first contribution to the field of education, "Culture, Education, and Communications Theory," appeared in *Education and Anthropology* (ed. George Spindler, 1955).

So many Associates have expressed interest in aspects of education and anthropology that we thought the present paper would be a promising basis for an experiment in self-selection of commentators. Thus this paper has not been given CA☆ treatment, but we strongly urge Associates to submit post-publication comments instead. Such comments will be sent to the author so that he may write a single rejoinder if he wishes, and both comments and rejoinder will then be published in a later issue of CURRENT ANTHROPOLOGY.

saw. The major selective factor was the observer's concentration on teacher-pupil interaction.

SOME THEORETICAL PROBLEMS

Humans must learn much more than other animals, and the evolution of *Homo sapiens* has been characterized by a great expansion of his dependence on learning and of his capacity to learn. This has been accompanied by an increase in the number of teaching devices. For these reasons the outline contains a partial inventory of the materials humans must learn and of teaching methods.

Although in the past thirty years or so the dependence of lower animals on learning has become apparent, due particularly to the work of the comparative psychologists, learning in *Homo sapiens* differs from that in other animals in some striking ways. Among these are the following. (1) In man, learning is dominated by symbolic processes. (2) In man, the motivational organizors of learning are more variable—that is to say, much less subject to innate determinants than in sub-human species. (3) There are apparently, in man, no innate limits on learning: the outer limits of the capacity of human beings to learn have not yet been discovered. (4) A striking feature of man is the extent to which his learning is polyphasic (Henry 1955*a*), that is, affected by a strong innate tendency to learn more than one thing at a time. While it is true, as Pavlov (1928) has shown, that animals also learn more than one thing at a time, polyphasic learning is much more extensive in man.

The combination in *Homo sapiens* of genetic variability, absence of obvious, biologically determined limits on learning, and great capacity for polyphasic learning, has brought it about that the social processes of learning have become extremely complex, and therefore require long-sustained and meticulous observation and recording by the researcher. The net, but by no means final, result of an effort to catalogue the actual—as distinguished from laboratory—learning *events* in human children is a long and complicated outline like the one offered here. When, to this, we add the dimension of cultural variability, the catalogue becomes even more impressive. It then becomes clear that the education of humans cannot be understood through conceptually reducing the entire process to a simple reward-reinforcement system (Miller and Dollard 1941).

The paradoxical aspect of human education is that in spite of the overshadowing tendency of human learning to variability and expansion, educational procedures have regularly taken as a model the innate release mechanism postulated by ethology (Tinbergen 1951). That is to say, it would appear that human societies have tried repeatedly to accomplish in their members a completely predictable response system. The model, though not the reality, of the educated human, is the mass tendency of an American audience to rise to its feet whenever it hears the national anthem: the response is predictable and almost automatic. Teachers in American elementary schools rely heavily on the culturally determined and learned tendency of children to raise their hands whenever the teacher wants the answer to a question; Pilagá mothers depend on the learned tendency of their children to recoil from the village boundaries or to duck into their houses whenever an adult shouts the term "sorcerer." The processes whereby these tendencies to respond predictably to single or complex symbols are internalized in the child form the matrix of education everywhere. The outline, particularly the sections on teaching methods (II) and on conduct control (IX), attempts to take account of these processes.

Thus, as one peruses the outline, one cannot but be struck by the fact that what is represents, in part, is a measure of the extent to which human learning has departed from that of lower animals. Stated another way, if one wished to obtain an answer to the question, "How does human learning differ from animals?" a first step might be to examine this outline, for here, quite apart from the general theoretical points raised, the mere catalogue of the dimensions of human education serves to place human learning on an entirely different plane from that of even the higher primates.

Further theoretical issues will be discussed in explaining the categories contained in the outline.

Explanation of the Outline

The outline contains twelve major sections, each divided into many sub-sections. Only those sub-sections the titles of which do not seem self-explanatory will be discussed. I have tried to present here both an explanation of the outline and a theoretical orientation to problems of education in its cross-cultural aspects. I have attempted also to raise theoretical issues of anthropological relevance insofar as they relate to matters impinging on education. For this reason the paper, in addition to being a set of explanatory notes, is also a collection of miniature theoretical essays.

I. ON WHAT DOES THE EDUCATIONAL PROCESS FOCUS?

The first step in a discussion of the educational process must be to make a reasonably complete catalogue of what is taught. The outline is an attempt to do this, from the point of view of what an observer can rather readily see with the naked eye. The theoretical point in this section is that, in humans, behavior is everywhere organized relative to a specific universe that is culturally determined, and that, accordingly, we need to know for each such universe what subject matter education includes. On the other hand, since, in each culture, an effort is made to exclude perceptions not relevant to its universe, education is also a process of exclusion (see I:10:2).

I:1. Environment (Other than Human)

In this section are catalogued factors in the natural, non-human, environment, in the broadest sense, and no

(*Continued on page 273*)

A Cross-Cultural Outline of Education

1. On what does the educational process focus?
    1. Environment (other than human)
        1. Flora
        2. Fauna
        3. Climate
        4. Geographical features
        5. Anthropomorphized flora
        6. Anthropomorphized fauna
        7. Anthropomorphized or zoomorphized machines
        8. Anthropomorphized or zoomorphized natural phenomena other than flora or fauna (winds, rivers, mountains, etc.)
        9. Space
        10. Time
        11. Motion
        12. Space-time-motion
        13. The world view of the culture
            1. Isolate-static
            2. Communicate-changing
                1. Engulfing
            3. Hostile or pacific
                1. Hostile
                2. Pacific
                3. Selectively hostile or pacific
            4. Geographical position of places studied
                1. Near: own town, state or province, village, tribe
                2. Near-distant: other states or provinces, nation in general; other villages or tribes
                3. Distant: other lands
            5. Temporal position
                1. Immediate
                2. Contemporary
                3. Near past
                4. Distant past
                5. Mythological past
        14. Clothing
        15. Food
        16. Transportation and communication
    2*a*. Values
        1. Good and bad: moral rules
        2. Work, success, failure
        3. Being on time
        4. Culture
        5. Proper dress
        6. Strength, activity, power
        7. Beating the game
        8. Politeness, tact
        9. Cooperation, helpfulness, togetherness
        10. Patriotism
        11. Cleanliness, orderliness
        12. Thrift, saving, don't waste
        13. Parents are good
        14. Prettiness, beauty
        15. Love
        16. Mother, motherhood
        17. Happiness
        18. Competitiveness
        19. Equality
        20. Novelty, excitement
        21. Pride
        22. Knowledge as value
        23. The "beautiful person"
        24. Private property
        25. Democracy
        26. Family
        27. Responsibility
        28. Generosity, doing more than required, non-commercialism
        29. The state
        30. Deference
        31. Enlightened self-interest
        32. Independence, toughness
        33. Physical intactness
        34. Sense of emergency
        35. Constancy
        36. Solicitude for others, kindness
        37. Composure under stress
        38. Courage
        39. Knowledge as means to an end
        40. Compromise
        41. Fun, relaxation
        42. Friends, friendship, faithfulness
        43. Fairness
        44. Flattery, empty praise
        45. Honor (integrity), personal autonomy
        46. Self-restraint
        47. Trying hard, don't give up
        48. Fame, ambition
        49. Honesty
        50. Prestige
        51. Niceness, likeableness
        52. Respect for authority
        53. Excitement
        54. Gentleness, non-violence
        55. Speed, alertness
        56. Sacredness, etc., of parents
        57. Flexibility
        58. Modesty
        59. Tolerance
        60. Freedom
        61. Peace
        62. Progress
        63. Wealth
        64. U.S.A.
        65. Loyalty
        66. Money, greed, etc., are corrupting
        67. Smartness, cleverness, thinking
        68. Profit
        69. Size
    2*b*. Value conflict
    3. Institutions
        1. Social structure
        2. Religion
        3. Economic system
    4. Technology, machines
    5. Reading, writing, and arithmetic
    6. Social manipulation
        1. Recognition-seeking behavior
        2. Manipulation of others
        3. Manipulation of self
    7. Responsibility
    8. How to compete
    9. How to take care of others

10. Use of the mind
    1. How to think
    2. Disjunction
        1. When to disjoin
        2. How to disjoin
        3. From what to disjoin
    3. Concentration
        1. Interest stimulation defining purpose; motivation
        2. Force
        3. Shutting out external stimuli
        4. Visualization
        5. Focused retention
    4. Preparation of the mind
    5. "Mental discipline"
11. Body parts or functions
    1. The voice
    2. The sphincters
    3. Care of the body (like getting enough rest)
    4. Posture
    5. How to relax
    6. The mouth
12. Art
13. History
14. Some other facts about which information is communicated
    1. About systems of rewards and punishments
    2. About what the culture promises its members
    3. About permitted and forbidden activities
    4. About how to get pleasure and avoid pain
    5. About whom to love and whom to hate
    6. How to handle frustration
    7. The difference between the real and the manifest (this refers to situations in which an effort is deliberately made to enable the child to see "behind" the obvious)
    8. About death
    9. About sex relations
    10. About race, class, or ethnic differences

15*a*. Instruction in identifiable adult tasks
15*b*. Teaching about adult tasks
16. Scientific abstractions
17. Science (general)
18. Routine procedures
19. Childish handiwork
20. Cultural stereotypes
21. Warfare and associated activities
22. Safety
23. Songs, music
24. Mythology
25. The object system
26. Games
27. Cultural fictions

II. How is the information communicated (teaching methods)?
1. By imitation
2. By setting an example
3. By instruction in schools, ceremonials, or other formal institutions
4. By use of punishments
5. By use of rewards
6. Problem-solving
7. Guided recall
8. Giving the child tasks to perform beyond his immediate capacity
    1. Jamming the machine
9. Mechanical devices
10. By kinesthetic association
11. By experiment
    1. By teacher
    2. By pupil
12. By doing
13. By symbolic association
14. By dramatization
15. By games or other play

16*a*. By threats
16*b*. By trials
17. By irrelevant association
18. By relevant association
19. Through art
    1. Graphic
    2. Music, general
    3. Songs
    4. Literature (stories, myths, tales, etc.)
20. By stating the opposite of the truth ("Water's a solid, isn't it?"); writing antonyms
21. By holding up adult ideals
22. Acting in undifferentiated unison
23. Physical force
24. By positive or negative assertion
25. Repetition
26. By specifically relating information to the child's own body, bodily function, or experience

27*a*. Through ego-inflation
27*b*. Through ego-deflation
28. Through use of humor
29. By telling
30. By watching
31. By listening
32. Question and answer
    1. Teacher question, pupil answer
    2. Pupil question, teacher answer
33. Holding up class, ethnic, national, or religious ideals
34. By doing something on his own

35*a*. By repeating the child's error to him
35*b*. By repeating the child's correct answer
36. By accusing
37. By following a model
    1. Human
    2. Non-human
38. By comparison
39. By filling in a missing part
40. By associative naming (e.g., a book mentions gingham as a material, and teacher asks students if they can name other materials)
41. By identifying an object (like going to the board and underlining "a noun" in a sentence)

42*a*. By group discussion
42*b*. By class discussion
43. Physical manipulation
    1. Bodily manipulation
    2. Bodily mutilation and other physical stresses
44. Rote memory
45. By working together with a student (as when teacher and student work together to make a battery, or as when teacher and student go over reference books together)
46. Through special exhibits
47. By having children read substantive materials (e.g., reading the chemistry lesson in the reader)
48. By putting the child on his mettle ("Now let's see how well you can read.")
49. Through group projects
50. By giving procedural instructions

51. By demanding proof
52. Through reports by students
53. By pairing (e.g., one child gives a word and calls on another child to give a sentence with the word; one child gives the state and another gives the capital)
54. By asking for volunteers
55. Through isolating the subject

III. Who educates?

1. Males or females?
2. Relatives or others?
3. On which age group does the burden of education fall?
    1. Peers
        1. Boy
        2. Girl
    2. Older children
        1. Male
        2. Female
    3. Adolescents
        1. Male
        2. Female
    4. Adults
        1. Male or female
        2. Younger or older
        3. Married or unmarried
    5. Others
4. Is education by "successful" people?
5. What rewards accrue to the educator?
    1. Enhanced status
    2. Material rewards
    3. Emotional satisfactions
6. Are there education specialists?
7. Does the educator wear distinctive dress or other insignia?
8. Is the educator of the same or of a different social group from that of the person being educated? (national, racial, class, etc.)

IV. How does the person being educated participate? (What is his attitude?)

1. Accepting
2. Rejecting, resistive
3. Bored, indifferent
4. Defiant
5. Inattentive
6. Social closeness of teacher and child
7. Social distance of teacher and child
8. Finds the process painful?
9. Finds the process gratifying?
10*a*. Competitively
10*b*. Cooperatively
11*a*. With inappropriate laughter
11*b*. Ridiculing peers
12. Laughter at humor of peers or teacher
13. Overt docility
14. Eagerly
    1. Facial expression
    2. Hand-raising
    3. Talking out
    4. Heightened bodily tonus
15. Through making independent decisions and suggestions
16. Asks for clarification, direction, etc.
17. Through spontaneous contributions or other demonstrations not precisely within the context of the lesson
18. Through spontaneous contributions within the context of the lesson
19. Attentively
20. Spontaneously humorous
21. Spontaneously expressive
22. Approaches teacher physically
23. Mobile–free
24. Immobile–constricted
25. Through performing special assigned tasks
26*a*. Hostile to peers
26*b*. Protective of peers
27. Diversion to peers
28. Anxiously
29. Disjoined hand-raising
30. By whispering to teacher
31. Laughs at peers
32. Corrects teacher
33*a*. Disruptively
33*b*. Critically
34. By carping criticism
35. By praising work of peers
36. Dishonesty, cheating, lying, etc.
37. Attempts to maintain order
38. Guiltily
39. With sense of inadequacy
40. With sense of adequacy
41. By copying from peers
42. Attempts to control the class
43. No response
44. Uses teacher's last name
45. Uses teacher's first name
46. Calls out to teacher
47. Uses kinship term
48. By public performance

V. How does the educator participate? (What is his attitude?)

1. Eagerly
    1. Facial expression
    2. Bodily movement
    3. Tone of voice
    4. Heightened bodily tonus
2. Bored, uninterested, etc.
3. Embarrassed
4*a*. Dominative
4*b*. Integrative
5. Insecure
6. Politely
7. Enjoys correct response
8. Resents incorrect response
9. Can't tell
10. Seeks physical contact with person being educated
11. Acceptance of blame
12. Putting decisions up to the children
13. Discouraging
14. Encouraging
15. Hostile, ridiculing, sarcastic, belittling
16. Relatively mobile
17. Relatively immobile
18. Personalizing
    1. Use of request sentence with name
    2. Use of name only
    3. Use of hand-name technique
    4. Use of equalizing, leveling term like "comrade"
19. Depersonalizing
    1. Use of class seating plan for recitation in succession
    2. Use of "next" or some such impersonal device

3. Use of "you" instead of name
4. Pointing, nodding, looking

20. Irritable
21. Accepts approach
22. Repels approach
23. Accepting of child's spontaneous expressions
24. Rejecting of child's spontaneous expressions
25. Humorous
26. Handles anxiety, hostility, discomfort, etc.
27. Acts and/or talks as if child's self-image is fragile
28. Acts and/or talks as if child's self-image is irrelevant
29. Defends child against peers
30. Responds to non-verbal cue other than hand-raising
31. Excessively polite
32. Keeps word
33. Fails to keep word
34. Praises and rewards realistically
35. Praises and rewards indiscriminately
36. Critical (does not point out good things in student's work)
37. Does not reward correct answer or good performance
38. Does not punish incorrect answer or poor performance
39. Acknowledges own error
40. Uses affectional terms like "honey" or "dear"
41. Awakens anticipation ("Now we are going to get some nice new books.")
42. The inclusive plural

VI. Are some things taught to some and not to others?

1. Do different age groups learn different things?
2. Do the sexes learn different things?
3. Are different groups taught different things?

VII. Discontinuities in the educational process

1. Discontinuities between age-periods
   1. In regard to techniques
   2. In regard to values
2. How do all of these apply between the sexes?
   1. Are discontinuities different for boys and girls?
   2. The secrecy of initiation rites

VIII. What limits the quantity and quality of information a child receives from a teacher?

1. Methods of teaching
2. Available time
3. Quality of equipment
4. Distance from the object
5. Ignorance or error of teacher
6. Stereotyping of the object
7. Failure of teacher to correct pupil's mistakes
8. Failure of teacher to indicate whether the pupil's answers are right or wrong
9. Failure of teacher to respond to a question
10. General vagueness or fumbling of the teacher

IX. What forms of conduct control (discipline) are used?

1. Relaxed
2. Tight
3. Sense of propriety
4. Affectivity
5. Reprimand
   1. Direct
   2. Gentle
   3. Mixed ("We like for you to have an opinion but it is childish for you to shout out your numbers like that.")
   4. Impersonal ("Some of you are holding us up.")
6. Ridicule
7. Exhortation ("How can I teach you if you keep making so much noise?")
8. Command
9. Command question or request
10. "We" technique
11. Instilling guilt
12. Cessation of activity
13. Group sanction
14. Threat
15. Putting the child on his mettle
16. Non-verbal signal
17. Reward
18. Promise of reward
19. Special strategems
20. Awakening fear
21. Using a higher power
    1. Human
    2. Non-human
22. Exclusion
23. Punishment
24. Encourages peer-group control

X. What is the relation between the intent and the results of education?

1. Relatively high correlation between intention and results
2. Relatively low correlation between intention and results

XI. What self-conceptions seem reinforced?

1. Ego-forming factors
   1. Syntonic: praise, support, status inflation
      1. Grandiose self-conception
   2. Dystonic: blame, shame, guilt, fright, exclusion, depersonalization

XII. How long does the process of formal education last?

(*Continued from page 268*)

attention is given to their "inner meaning." However, it does appear relevant to point out that, whereas a primitive child's knowledge of the flora and fauna in his environment generally has direct survival-relevance, this natural world of flora, fauna, and even weather is largely peripheral to the life of the child in industrial cultures.

I:1:5. ANTHROPOMORPHIZED FLORA; I:1:6. ANTHROPOMORPHIZED FAUNA; I:1:7. ANTHROPOMORPHIZED OR ZOOMORPHIZED MACHINES; I:1:8. ANTHROPOMORPHIZED OR ZOOMORPHIZED NATURAL PHENOMENA OTHER THAN FLORA OR FAUNA (WINDS, RIVERS, MOUNTAINS, ETC.)

One of the principal functions of anthropomorphized animals is to serve as a medium for the transmission of values. The *Panchatantra* of India is an excellent example of this from a literate culture. In the life of young children in industrial cultures, this function overshadows the real aspects of animals. Everywhere, flora and other non-animal natural phenomena function less in this way.

The use of anthropomorphized and zoomorphized machines as vehicles for general ideas is well illustrated in M. Ilin's *The Story of the Great Plan*. Written to acquaint Soviet boys and girls twelve to fourteen years old with the Five Year Plan launched in 1928, it appeared in English under the title *New Russia's Primer* (1931). Ilin makes vivid and poetic use of anthropomorphized and zoomorphized machines and natural phenomena to communicate to children a breathless, value-laden excitement about the Great Plan. Some examples will illustrate the point:

> There is a giant excavator. It has only one arm, but this arm is twenty meters in length. In its hand it holds a shovel. . . . The scoop cuts into the ground with teeth made of forged steel and is filled with earth. . . . The giant excavator turns to the left in a circle, as a soldier at a drill [Ilin 1931: 30–31].

> Wind, water, coal, wood, may not be alive, but they can be forced to work. They can be compelled to turn the wheels of machines. In Baku the wind flaps the wings of a windmill . . . [Ilin 1931: 33].

> Our mountains and plains are well supplied with rivers. These rivers could give us 65 million horse-power of electrical energy. But to compel them to work for us is not so easy. Man must fight the river, as the animal-tamer tames wild beasts. If he becomes careless only for a moment, he will make a mistake and the beast will spring upon him and tear him to pieces [Ilin 1931: 35–36].

It would appear that the function of this kind of writing is to bring the children closer to the machines and the land in order to adapt the children to the requirements of the economic effort.

I:1:12. SPACE-TIME-MOTION

An example of teaching materials involving simultaneous consideration of space, time, and motion is the statement that, "It takes a plane, traveling *X* miles an hour, *Y* hours to get from *B* to *C*."

I:1:13. THE WORLD VIEW OF THE CULTURE

I:1:13:1. *Isolate-Static.* A culture with an "isolate-static" world view sees itself as isolated from the rest of the world, fixed in respect to its spatial orientation on the earth's surface, and static in regard to change. This is typical of the *Gemeinschaft* type of society.

I:1:13:2. *Communicate-Changing.* A culture with a "communicate-changing" world view is in communication with the surrounding world, is expansive in regard to its orientation on the earth's surface, and dynamic in regard to change. This is a world outlook in which the members of the society see themselves in contact with the rest of the world and are oriented toward change. The attitude is characteristic of the *Gesellschaft*.

I:1:13:2:1. *Engulfing.* The culture with an "engulfing" world view is one that views itself as conquering and swallowing up other cultures. This would characterize the Nazi world view (Childs 1938: 107 *et seq.*) and the Inca world view.

I:1:13:3. *Hostile or Pacific*

I:1:13:3:3. *Selectively Hostile or Pacific.* Some groups divide the world into friend and foe, and attempt to instill in children hostility toward foes and acceptance toward friends. The Kaingáng, however (Henry 1941), have no friends outside the narrow group of the extended family, and view themselves as surrounded by enemies. Something similar seems to characterize the Sirionó (Holmberg 1950), but particularly with respect to the band.

I:1:13:5. *Temporal Position*

I:1:13:5:5. *Mythological Past.* Subject matter from the mythological past is a category delineated from the point of view of the ethnographer, since, as some peoples see it, there is no separation between the real and the mythological past. For example, there are many people nowadays to whom the biblical story of Jonah who, swallowed by a whale, lived inside it, may still be true. The distinction made by the ethnographer is one of convenience, and he can always explain the native attitude.

I:2*a*. VALUES

In the course of the research, no less than sixty-nine values were tabulated. This is partly because "value" was construed to mean any normative idea or sentiment, in Radcliffe-Brown's sense, that serves as an organizer of culturally standardized behavior. Thus honesty (I:2:49) has been listed as a value, but so have dishonesty, deception, and chicanery (I:2*a*:7) because they too are normative organizers, as among the Alor and Chagga (Du Bois 1944: 64, 65, 66; Raum 1940: 210, 211). Values are dealt with here without reference to what should be, but rather with reference to what is expressed in the on-going life of the culture.

A focus on values in the study of educational processes has implications not only for understanding the organization of behavior, but also for understanding polyphasic learning, since education, the fundamental organizing process, occurs always in a context of values, and teachers are usually teaching values by implication, regardless of the immediate subject matter. When, for example, a Pilagá mother tells her baby to give his food to a relative (Henry and Boggs 1952), the baby's behavior is being organized with respect to a particular group of people at the same time that he is learning it is good to give food away. In the example quoted above

from *New Russia's Primer,* the values of challenge, mastery, bigness, man-over-nature (F. Kluckhohn 1951), compulsion, struggle, danger, vigilance, and mechanization all appear in a text acquainting the children with the Five Year Plan and what must be done to effect it.

Values may be openly asserted, such as, "It is good to work hard"; be expressed indirectly, as in the *Primer* (Ilin 1931); or be conveyed in a situation, such as in the East European Jewish *shtetl* where children had to work hard at their studies all day long in the *kheder,* early elementary school (Zborowski and Herzog 1952: 89), with no appeal to "fun-in-learning." Of Ilin's book, one may say that it "breathes an ideology." Soviet education (Counts and Lodge 1947) is very sensitive to values, and, to judge from Counts's and Lodge's book, faces squarely any problems connected with them. This is true also of *kibbutz* education in Israel (Spiro 1958: 256). Meanwhile, there is always the question of the relation between ideology and results, and this ought to be studied in all educational systems. In this connection, one difficulty is that a teacher's own unconscious behavior may contradict the values he is attempting to teach; another is that the educational system may attempt to emphasize contradictory values (see I:2*b*).

I:2*a*:23. THE "BEAUTIFUL PERSON"

The "beautiful person" refers to an ideal best described in the literature for traditional China and the Jewish *shtetl.* The following from Zborowski and Herzog (1952: 81) expresses the idea. Speaking of the *talmid khokhem,* the "wise student and scholar," they say:

> He is not even expected to know the value of money, but it is taken for granted that the keenness of his mind, sharpened by lifelong study, will allow him to penetrate the most complicated business.
>
> A talmid khokhem, a wise scholar, is easily recognizable in the streets of the shtetl. He walks slowly, sedately, absorbed in his thoughts. His speech is calm, rich in quotations from the Bible or the Talmud, allusive and laconic—his words "are counted like pearls." He is greeted first by other members of the community, in deference to his high position. Not only the poor but also the wealthy greet him first, if they are less learned than he. . . .
>
> A learned man seldom laughs aloud. Excessive laughter, like any sort of excess, is considered the mark of an amorets [boor]. . . . The talmid khokhem must indicate his dignity and sophistication by his behavior and his appearance.
>
> The shtetl ideal of male beauty again reflects the high value set on learning. A man with *hadras ponim,* a distinguished, beautiful face, ideally has a long beard—symbol of age and therefore of wisdom. His forehead is high, indicating well-developed mentality; his complexion is pale, revealing long hours spent over books. Thick eyebrows showing penetration jut out over deep-set, semiclosed eyes, indicating weariness from constant poring over texts—eyes that shine and sparkle as soon as an intellectual problem is discussed. Very important are the pale, delicate hands, evidence that the owner has devoted his life to exercise of the mind rather than of the body.

The relevance of such a value to this study is that it anchors moral and behavioral ideology to a fixed image, which serves as a guide to the organization of general cultural behavior. For students of social organization and disorganization—for the understanding of problems of anomie—it is important to examine the difference in functioning between societies that have such guides and those that do not. A problem of contemporary society is that it has no beautiful people—only beautiful actresses.

I:6. SOCIAL MANIPULATION

The teaching of social manipulation looms large in all cultures but is given relatively little attention in anthropological monographs or in writings on education. "Social Manipulation" includes all techniques for getting along with other people and for using people as instruments for survival, social mobility, and so on. Training in "being nice to people," in smiling, in ingratiation, etc., fall under this I:6. Outstanding among techniques of recognition-seeking (I:6:1) in American schools is, of course, the raised hand. "Manipulation of Self" (I:6:3) refers to training in how to handle one's self: role-taking, and self-restraint in social situations, fall in this category.

I:10. USE OF THE MIND

I:10:1. HOW TO THINK

Nowadays, in America, there is much talk about teaching children to think. In five years of observation in American schools, however, we have found very little behavior that tends in this direction, and, therefore, this category is not expanded in the outline (in contrast, for example, to I:10:3). Thinking would seem to involve an analytical process of some kind and also a process of synthesis. Almost none of this takes place in elementary school (though we have found it occasionally), and little more even in high-school science courses.[1] Our research has not discovered in primitive societies emphasis on teaching children to think.

I:10:2. DISJUNCTION

The category "Disjunction" refers to situations in which the child becomes a non-participant, or in which the environment behaves in one way and the child *withdraws* instead of behaving in the expected manner. The American child who keeps his hand raised in the air regardless of what is taking place in the classroom is typical. In general, this category refers to all those situations in which the child withdraws mentally from the environment. This is the, "It-does-not-concern-me" effect, or the, "I-dismiss-it-from-my-mind" effect.

Training in disjunction occurs at every level in American schools, and most of it occurs without conscious effort by the adult. Rather, the adult, notably the classroom teacher, is constantly concerned to prevent disjunction. Nevertheless, lessons in subjects in which children are not interested, for example, are lessons in disjunction, for the children become detached from the subject matter, and, in an effort to escape from boredom may cast about—through daydreaming, drawing, or reading a forbidden book under the desk—for some way of escaping from the situation. Since the child discovers that one or another of these techniques is psychologically rewarding, he tends to revert to it whenever the uninteresting subject matter comes up, and, in this

[1] In the United States the first eight years of school are called elementary school, grammar school, or the primary grades. They are for children from six to fourteen years of age. The next four years are called high or secondary school. After completion of high school the individual is ready for college.

way, becomes educated in disjunction. The child who keeps his hand up in class even though he does not know what is going on—as evidenced by his confusion if the teacher calls on him—is one who disjoins from the subject matter but remains in touch with the social requirements of the situation. The capacity to dismiss things from one's mind—to "filter out" unwanted stimuli—is an important capacity in a complex culture like that of the United States where one is always in danger of being inundated by stimuli. The process of disjunction, in the sense intended here, is not described in the literature for non-industrial civilizations, though it did occur in traditional China (Yang 1945: 145, 147; Williams 1849: 434) and in the East European Jewish *shtetl* schools (Zborowski and Herzog 1952: 88, 104).

Dismissing a thing from the mind is one aspect of the general process of filtering. At the beginning of section I, it was remarked that all cultures organize behavior with respect to their own culturally selected portion of the universe. This must mean that education attempts to exclude from perception (filter out) all aspects of the surroundings not included in the culturally delimited universe. We know, in a systematic way, practically nothing about how adults train children to exclude from perception everything that does not belong in the culturally-standardized perceptual universe.

The narrowing of the perceptual field is accomplished in part through emphasizing only certain things during education. By this process, nothing that is not emphasized will be learned by the child. Meanwhile, since humans are inveterate polyphasic learners (Henry 1955*a*), the process is never completely effective, and the resultant educational failure must be one of the sources of sociocultural conflict and change. We may speculate that very stable cultures have perfected, or nearly perfected, the process of narrowing the child's perceptual field—of training the child to dismiss from his mind anything not selected for his perceptions by the culture.

In section II, we will consider in more detail this process of narrowing the perceptual field.

I:10:3. CONCENTRATION

I:10:3:2. *Force.* The use of force to compel students to concentrate is described by Zborowski and Herzog (1952: 89–104) for the East European Jewish *shtetl* culture where children in the *kheder,* the earliest years of school, were struck by the teacher if their attention wandered.

I:10:3:5. *Focused Retention.* "Focused Retention" refers to efforts to achieve concentration on the part of the child by obliging him to focus on textual materials. Thus, in reading in elementary schools, the children, through being required to answer questions about stories, learn to fix their minds on the details of the text.

I:16. SCIENTIFIC ABSTRACTIONS; I:17. SCIENCE (GENERAL)

The difference between "Scientific Abstractions" and "Science (General)" may be exemplified as follows. In the former, instruction is given in the nature of electricity, while in the latter, the child is taught how to make a battery. In the former, a student in biology is taught that the cell is the basic building block of all organisms, while in the latter, he is told the structure of the cell.

I:18. ROUTINE PROCEDURES

"Routine Procedures" has to do with actions such as distributing books, collecting papers on which the children have done their lessons, and so on.

I:19. CHILDISH HANDIWORK

Making valentines, mat-like holders for pots, etc.—all those time-killing activities that help fill the day in many American elementary schools—fall into the category of "Childish Handiwork." On the other hand, one ought not to include here the making of seed necklaces, flower chains, etc., that are *used* by the children in their games (Gorer 1938: 308–309; Chaudhuri 1951: 21). Rather, where such activity is taught by adults, one ought to delineate a separate, appropriate category, such as "how to make toys or game-relevant objects."

I:25. THE OBJECT SYSTEM

In all societies material culture is part of a complex of interpersonal relations, values, beliefs, and patterns of spatial arrangements. For example, in American culture a stove is made, owned, sold, and bought as private property. As part of the American system of values, however, it not only expresses the value of private ownership, but, by its quality and form, expresses a standard of living, which is also held as a value. Furthermore, children and adult males are generally aloof from stoves, and although this is changing, it is on the whole still true that in American homes most of the time it is women who operate the stove. Again, stoves are sold not only in terms of their beauty and cost, but also in terms of their capacity to heat rapidly, which thereby gives expression to the value of speed. Finally, in regard to patterns of spatial arrangement, stoves are almost always kept in the kitchen, sometimes in the living room —if the living room is in a modern, compact, apartment, where the kitchen may be separated from the living room merely by a difference in furnishings, including the stove—and never in a bedroom. The complex of associations that attaches to objects of material culture is here called the "Object System," and it is one of the principal foci of education in all societies. Mead says of Manus children (1939: 32–33):

> . . . In Manus where property is sacred and one wails for lost property as for the dead, respect for property is taught children from their earliest years. Before they can walk they are rebuked and chastised for touching anything which does not belong to them. . . . The slightest breakage is punished without mercy. Once a canoe from another village anchored near one of the small islands. Three little eight-year-old girls climbed on the deserted canoe and knocked a pot into the sea, where it struck a stone and broke. All night the village rang with drum calls and angry speeches, accusing, deprecating, apologizing for the damage done and denouncing careless children. The fathers made speeches of angry shame and described how roundly they had beaten the young criminals. The children's companions, far from admiring a daring crime, drew away from them in haughty disapproval and mocked them in chorus.

It can be seen from these examples that the object

system is the broader system within which an economic system (I:3:3) may fit: "Economic System" refers to patterns of production, distribution, and consumption of objects, while "Object System" refers to objects in all their aspects. When a child in an American elementary school is taught to collect books and *put them in the closet*, the knowledge that books belong in a closet is knowledge about the object system, while the relevance of that knowledge to the economic system is rather remote.

I:27. Cultural Fictions

A "cultural fiction" is an idea known by at least one group in the culture to be untrue. There comes a time in the life of a person in such a culture when he learns that the idea is a fiction. For example, the Chagga fiction that men do not defecate is revealed as untrue to Chagga boys at initiation (Raum 1940: 248); and the Hopi fiction that the dancing figures in the plaza are gods is revealed as a fiction also at initiation (Eggan 1956). Thus learning a cultural fiction refers to the revelation of the fictional nature of an idea.

It is not always clear what the function of the revelation itself is. In Hopi (Eggan 1956), the revelation seems to precipitate a reorganization of the personality in the effort to manage the overwhelmingly shocking realization of the deception that has been worked on one, and to accelerate (1) a turning away from childish ways, (2) a turning toward adulthood, and (3) a turning inward of the personality toward self-examination and -criticism. While (1) and (2) seem to be present in Chagga also, there is no evidence of (3). Rather, there appears the development of an extreme insecurity of men with respect to women, and a concomitant hostility. On the other hand, it may be, also, that the men's awareness that psychologically they are frauds may be an added incentive to them to attempt to validate themselves as genuine warriors and workers.

Hopi and Chagga practice represent formalizations of the widespread use of fictions for the achievement of various cultural goals. Actually, fictions seem to have dysfunctional effects in the long run: even the Hopi case, so sympathetically described by Eggan, seems to have had long-run dysfunctional effects in residual hostility and oppressive guilt.

II. HOW IS THE INFORMATION COMMUNICATED (TEACHING METHODS)?

Pettitt (1946: 40 *et seq.*) has emphasized the importance of knowing exactly what techniques adults use to teach children. This section is devoted to the elucidation of the problem of specificity in reporting such data. The following quotations illustrate certain excellences and certain shortcomings:

> Eskimo mothers begin exercising the arms of young infants in the motions of paddling . . . [Pettitt 1946: 43].

> Freuchen illustrates the eagerness of Eskimo parents to encourage hunting pursuits by young children. A three-year-old boy, Megusak, happened to sight a distant polar bear before anyone else saw it. He was praised mightily, and when the bear was killed a spear was put into his hands so that he could give it a poke, whereupon they praised him more [Pettitt 1946: 43].

> When [a Manus boy] is about a year old, he has learned to grasp his mother firmly about the throat, so that he can ride in safety, poised on the back of her neck. She has carried him up and down the long house, dodged under low-hanging shelves, and climbed up and down the rickety ladders which lead from house floor down to the landing verandah. The decisive angry gesture with which he was reseated on his mother's neck whenever his grip tended to slacken has taught him to be alert and sure-handed [Mead 1939: 23].

The description of the Eskimo mother exercising her infant in the motions of paddling could hardly be more specific, except to state more precisely how the baby's hands were held and, perhaps, whether the mother sang a song, and so on. The second example is strikingly specific. What is lacking is some statement to the effect that the child was *told* to poke the bear. The example from Manus would be better if we were told how the child learned to grasp its mother about the throat. On the other hand, the observation that the mother reseats the baby on her neck with a "decisive angry gesture" is the kind of specificity needed to clarify the learning process.

In contrast, the following is vague:

> By the time a boy is 3 years of age he is already pulling on some kind of bow, and with his companions he spends many hours shooting his weapons at any non-human target that strikes his fancy . . . and when his marksmanship is perfected he is encouraged to stalk woodpeckers and other birds that light on branches near the house.
>
> . . . the boy gradually learns when, where and how to track and stalk game. His father allows him to take easy shots, so as to reinforce his interest in hunting. . . . During all this time, of course, he is also learning to make bows and arrows . . . [Holmberg 1950: 378].

The reason the description is vague is because we are not told how the boy is taught to pull "on some kind of bow," how his marksmanship comes to improve, how the boy is "encouraged to stalk woodpeckers," or how he learns to track game or make bows and arrows.

The purpose of section II is to raise in all its complexity the question of the specificity of teaching methods.

II:1. By Imitation

In his chapter on "Imitation versus Stimulated Learning," Pettitt attacks the uncritical use of the term "imitation," pointing out that most of what has been called imitation is really "directed practice" (Pettitt 1946: 44) under the stimulation and guidance of adults. He reserves the term "imitation" for learning experiences in which the child *spontaneously* copies a human model. Pettitt also provides a host of examples of child learning that are accounted for under separate headings in the outline accompanying this paper. Molecular analysis of the educational process makes the category "imitation" a residual one in which may be placed all examples of copying that do not fall into *other* categories in this section, most specifically:

II: 2. By setting an example
12. By doing
15. By games or other play
30. By telling
31. By watching

32. By listening
37. By following a model
    1. Human
    2. Non-human

II:3. By Instruction in Schools, Ceremonials, or Other Formal Institutions

The ceremonial initiation is a common device for educating children in primitive cultures. The Murngin (Warner 1937) and Chagga (Raum 1940) are good examples. Schools, that is, relatively permanent buildings especially dedicated to education, are not familiar outside of the literate civilizations. In undeveloped forms of education in the literate cultures, teachers' homes have been used (Zborowski and Herzog 1952: 89; Bayne-Powell 1939: 57, 61). Poor Arabs in Egypt have built simple schools (*maktab*) for instruction in the Koran (Ammar 1954: 206). The use of buildings for systematic instruction, whether a teacher's home or a separate school building, seems to be associated with literacy, occupational specialization, and target-seeking learning; instruction through ceremonials appears to occur in societies where more diffuse learning patterns are institutionalized (Henry 1955*a*), together with highly structured personal communities (Henry 1958). Ceremonial education seems to bring together two things: the responsibility of the broader kin group and the communication of knowledge.

In *The West African "Bush" School,* Watkins (1943) describes aboriginal schools for boys and girls, conducted by secret societies and lasting from about two to eight years. The schools are isolated from the ongoing life of the tribe, and the buildings are destroyed when the session is over. There are separate schools for boys and girls. "No one except members of the society is permitted entrance to the [school] area." Among the Vai,

> The principal official of the school is the *dá zò:* . . . "the leader who stands at the mouth or head," who is endowed with wisdom and mystic power in a superlative degree. He has a majestic status in the society [see III], is respected by the chief and elders of the tribe, and is honored with intense devotion by the youth of the land [pp. 668–69].

Among the Kpelle,

> The grandmaster, *namu,* is, of course, a human being and is known as such by the members. At the same time he has attributes which raise him above the merely human [p. 669].

In these schools,

> The boys are divided into groups according to their ages and aptitudes and receive instruction in all the arts, crafts, and lore of native life. . . . The first instruction involves a series of tests in order to determine individual differences, interests, and ambitions. . . .
>
> All this training is tested out in the laboratory of "bush"-school life. For example, instruction in warfare is accompanied by actual mock battles and skirmishes. . . .
>
> Life in the secret society is a complete *rite de passage* from the helplessness and irresponsibilities of childhood to citizenship in a world of adults. Thus a youth acquires a new name in the *beli,* according to his rank in the group and his achievements. . . . Entrance to the society is a symbolic death for the young, who must be reborn before returning to the family and kin. Those who die from the strenuous life are considered simply not to have been reborn, and their mothers are expected not to weep or grieve for them [pp. 670–71].

Here, then, is an entire area of the pre-literate world where there are schools similar in many ways to those of the literate world. It is hard to believe that these schools are not a combination of native initiation rituals and the White man's idea of a school.

II:4. By Use of Punishments; II:5. By Use of Rewards

In the *Ethica Nicomachea* (1172^a: 20), Aristotle says of pleasure that "it is thought to be most intimately connected with our human nature, which is the reason why in educating the young we steer them by the rudders of pleasure and pain." Since these are used consciously in education by all societies, it would seem that their use must reflect that "psychic unity" of mankind of which anthropologists speak. II:4 ("By Use of Punishments") does not refer merely to the use of pain as an accompaniment to learning (see II:16*b*) but to the use of punishment as a means of redirecting deviant behavior. Similarly, II:5 ("By Use of Rewards") refers to recognition of accomplishment, as when, for example, adults in American society express to the child pleasure at his mastery of language, walking, or going to the toilet instead of wetting. When the Chagga (Raum 1940: 135) tie little bells to a baby's ankles to "give him pleasure in stamping his feet so that he may become steady on his legs," this is not reward in the sense implied here. But if the mother hails the child's efforts to walk with articulate joy, that is reward in the sense implied here.

One of the most interesting problems in education is the shift that takes place from reward for conformity to mere punishment for non-conformity as the child grows older; and the gradual dropping out of rewards as the child's competence comes to be taken for granted. One might hypothesize, for example, that the American middle-class child who, let us say, is praised every time he passes a "dry night," might feel disappointed when his dryness is taken for granted. On the other hand, he might feel insulted, once dryness has been achieved, if he is still praised for something that any child of his age ought to be able to do. The problem may be summed up as follows: when a child has been rewarded for his childish accomplishments, how does he feel when these sources of recognition come to an end, especially when he is then punished for his lapses?

II:6. Problem-Solving

"Problem-Solving" refers not to answering a question in arithmetic or filling in a missing word in a sentence, but to analytico-synthetic processes that bear on the logic of a situation. It is closely related to the idea of decision-making. For example, there is a story in an American fourth-year reader (Gray *et al.* 1956) in which a man and a boy are in a rowboat on the water when a fog comes up. The boy knows the coast, but the man does not. The man asks the boy to let him row, and the boy, just "to be polite," lets him, even though there is grave danger from rocks. Here a *problem* would be: "Did Andy do the right thing in letting the man row?"

II:7. Guided Recall

"Guided Recall" refers to the nearly universal procedure in American elementary and even high schools whereby the pupil is guided by the teacher in recalling to mind the specific content of a lesson. With reference to the example in II:6 above, guided recall would involve asking questions such as the following: "Where were they?" ("Out in a boat.") "What happened?" ("A fog came up.") "Why was it dangerous?" ("Because of the rocks.") In guided recall, problem-solving opportunities in the lesson are not exploited.

II:8. Giving the Child Tasks to Perform Beyond His Immediate Capacity

II:8:1. jamming the machine

Fortes says of education in Taleland that, "A child is never forced beyond its capacity" (1938: 13). In American schoolrooms on the other hand, in spite of the ideology of "readiness," [2] one observes a constant urging of children, sometimes to the limits of their capacity, toward a culturally determined standard of mastery. The result of this is that the learning "machine" sometimes becomes "jammed," and a child may, at that moment, be completely unable to perform. The following is an example from a fifth-grade class (Henry 1955: 202):

> The child at the board stares at $\frac{2}{3}$ minus $\frac{2}{3}$. There is a faint titter, snicker,[3] giggle or something. . . . as the child stares, nonplussed by the problem. The teacher goes up to her and demonstrates with a measuring cup: "If we have $\frac{2}{3}$ of a cup here, and we pour it out, what is left?" The child remains baffled, and the teacher says it again, seeming to try to force her presentation of the problem on the child in such a way as to cut out the distracting influence of the class, which is eager to be helpful. Child finally says, "Nothing," and the teacher says, *"That's right."*

In these contemporary schoolrooms, the child who says "I can't" is urged until he can. As I read Fortes, I would interpret him to mean that, given a situation like the above, the Tale would let the child be, and try again a month or a year later. On the other hand, the Chagga (Raum 1940) would appear to be much more determined than the Tale in their resolve to bring the child up as quickly as possible to a level of performance. The "blackboard paralysis" we have seen above is a bio-social phenomenon that can occur only when there is a critical moment in the educational process at which massive pressures are brought to bear on a child to get him to perform an incompletely mastered task within a narrowly limited time. These are the conditions for what is here called "jamming the machine."

II:10. By Kinesthetic Association

By "Kinesthetic Association" is meant the accompaniment of learning by gross muscular movement. Thus a Murngin boy (Warner 1937) who executes a large number of ceremonial movements while he is learning the tribal traditions during initiation may tend to remember the traditions well because they have become associated to a complex series of physical manoeuvres. In the same way, a child in an American elementary school who paints a picture of some African scene when he is learning the geography of Africa may tend to remember his lesson well because the gross physical movements involved in painting become associated with the lesson. Finally, the child who goes through the *movements* of a play he enacts in connection with a lesson on Africa may tend to remember Africa not only because of the actual contents of the play but also because he has "gone through" Africa with his body!

II:12. By Doing

"By Doing" refers only to education in which the child learns a life-role by performing that role—for example, when a child learns to farm by cultivating the soil, or to fish by fishing. This contrasts with learning something *about* farming by reading on the life of a farmer. It does not include learning arithmetic by doing arithmetic, or learning reading by reading, etc.

II:13. By Symbolic Association

The display of totemic emblems (Warner 1937: 345) in an Australian initiation is education in basic tribal ideas concerning religion and social structure through symbolic association. The emblem is a symbol with which the boy associates the religious and socio-structural ideas. When a teacher in an American school draws a picture of a shamrock on the blackboard while she is talking about St. Patrick's Day, this also is education through symbolic association. Another example is education of the Chinese boy in his ancestral traditions through showing him the clan books (Chiang 1952: 9).

II:14. By Dramatization

Any act in which children dramatize a cultural fact is education through "dramatization," whether it be ritual enactment in a ceremonial, or secular acting out of a story, as fourth-grade American children might act out the story of "The Golden Pears" (Gray *et al.* 1956).

II:16*b*. By Trials

The use of physical trials or endurance tests as part of the educational process has had a wide vogue. Pettitt (1946) has documented this usage for the North American Indians. Raum (1940: 205–208) says that at about twelve years of age Chagga boys are taught "endurance and diligence" with the hoe, and that,

> When the boy gets tired, he is threatened or beaten. The father scorns to take refreshment to him; this makes the boy's trial the more excruciating. Girls who hoe with their mothers are occasionally given something to nibble.
>
> [In learning how to plant bananas, the boy] sometimes has to carry a heavy plant for several miles, and begins to weep or ask permission to set his load down. His father tells him to bear up.

These excerpts from Raum illustrate not only II:16*b* but also the use of physical force (II:23), and the use of threats (II:16*a*), in education.

The following from India illustrates another, apparently idiosyncratic, trial (Chaudhuri 1951: 43):

> I contracted a life-long dislike for a most estimable relative

[2] The educational theory according to which all curricula should be carefully planned so that a student enters on each new subject matter and each advance in an old subject matter in terms of graduated steps that prepare him ("ready" him) for the change.

[3] To *snicker* is to laugh in a sly, partly stifled manner.

of mine by being told that he was such a conscientious student that he never used the mosquito net, lest left in peace by the mosquitoes he might over-indulge himself in sleep, and also that before examinations he tied his legs with a rope to the beam so that, not being able to lie flat and in comfort on his bed, he might be cogitating his books in a state of half wakefulness.

II:17. By Irrelevant Association; II:18. By Relevant Association

There is an American game called "spelling baseball," for which the children in a classroom are divided into two teams. The teacher gives each child in turn a word to spell, and, if it is spelled correctly, the child is credited with "a hit" and goes to "first base." His next teammate is given a word, and, if the teammate is correct, he goes to first base and the first child moves to second base—and so on, until the team gets a "run." Each misspelled word is an "out." In this game, the competition runs high, and the children are nervously alert. Yet it is education through irrelevant association, because there is no connection between spelling and baseball: a perfectly illiterate man might make an excellent ballplayer. On the other hand, a game of "cafeteria," in which the children play at being in a cafeteria, and having to spend money and figure the bill while making payment with toy money to a child appointed as cashier, is education through relevant association, because it is necessary to know how to count in order to buy in a real cafeteria, or in order to manage one. The American educational process does not reveal many examples of education by irrelevant association, and our research has not uncovered any at all from other cultures.

II:19. Through Art

Education *through* art is not education *in* art.[4] Education through art is the issue here: it has to do with the use of artistic endeavor to facilitate the learning process. When children are being taught about Africa, and have an art period in which they draw or paint pictures of Africa, this is education through art; when they are having a lesson on "Ireland and her neighbors," and sing songs from those countries, this too is education through art, for songs are an art form. Obviously, education through art can be considered from another point of view, i.e., the educating of children through the use of artistic creations by others, such as plays or paintings. A good example is the play of Bali (Belo 1949), which is at once artistic and educational. The Balinese plays are also entertaining. The American analogue, but on a much, much lower level almost wholly lacking in artistry, would be the pre-processed television cartoons that are used in some educational systems for teaching purposes. In this latter case, however, we are really dealing rather with II:9, education through the use of mechanical devices, rather than with education through art.

[4] Most art lessons in American public schools are not lessons in art, for the reason that most teachers do not know how to teach art. The curriculum may produce art *periods*, during which the children paint or draw or cut out so-called "abstractions," but the periods are usually not art *lessons*. The art periods in many school systems are merely minutes during which the children engage in some manual exercise prescribed by a routinized municipal curriculum. During such moments, the children may make valentines, puppets, tiny woven mats to hold pots, etc., according to prescribed rules. Many teachers see the art period merely as a relaxation for the children, and only two of the regular teachers in our sample of several dozen seemed even to try to give any instruction in art at all.

II:24. By Positive or Negative Assertion

Asking leading questions such as, "We like rhyming words, don't we?" or making statements such as, "The illustrations are very clever," which the child is not expected to challenge, is what is implied by "positive or negative assertion." It would appear that what the teacher is aiming at by such verbalizations is student acquiescence-through-affirmation—a kind of acceptance-through-head-nodding. The *intent* of such verbalizations can be grasped if one tries to imagine any child saying, "No, teacher, I hate rhyming words," or, "But really, teacher, I think the illustrations are terrible."

II:26. By Specifically Relating Information to the Child's Own Body, Bodily Function, or Experience

Teachers in American elementary schools make broad use of the method of specifically relating information to the child's own body, bodily function, or experience. A reading lesson about pets will call forth from the teacher the question, "Do any of you have pets?" A lesson on the functions of the body will lead the teacher to ask, "What happens when you run?" ("We get out of breath.") Spiro (1958: 258) says of education in the *kibbutz:*

> The teacher generally attempts to make the subject meaningful in terms of the child's own experiences and his immediate (physical or temporal) environment. In a fourth-grade art lesson, for example, the objects cast in plaster-of-Paris were animals and flowers with which the children were immediately familiar; in seeking for a subject for a drawing class shortly before the advent of Passover, the teacher suggested that the children draw a Passover scene. . . .
>
> But the teacher attempts to relate the materials not only to the child's immediate experiences, but to his deepest interests as well. In a second-grade lesson in arithmetic, for example, the exercises in addition and subtraction were concerned with the winning and losing of marbles—an activity in which almost all the children were temporarily absorbed.

This subject is discussed further in section VII.

II:27*a*. Through Ego-Inflation

The method of "ego-inflation" aims specifically at the child's conception of himself. A procedure, such as praise, for example, that enhances a child's opinion of himself or makes him feel appreciated, falls in this category. II:27*a can* differ from II:5 in that the latter can be mere recognition of a lesson well learned, as in the case of an American child who is permitted to use the family car when he has learned how to drive. II:27*a*, on the other hand, is aimed *specifically* at improving a child's opinion of himself. II:27*a* and II:5 may coincide in the same act, as in praise, for example.

II:27*b*. Through Ego-Deflation

A procedure, such as humiliation, for example, that diminishes the child's opinion of himself, falls in this category "Ego-Deflation."

II:30. By Watching

Probably all education involves some watching, but this category II:30 attempts to capture that learning situation which is construed largely as one in which the learner learns primarily by watching. Thus Chiang says (1952: 58):

> I do not remember that I ever had any proper lessons in painting from my father. He told me to watch him as closely as possible. . . . I remember that after watching my father painting a few times I thought I knew just how to paint, but when I actually began I found I was mistaken! . . . I asked my father to help, but he only smiled and told me to watch him again.

Fortes has the following to say about the Tale (1938: 13):

> Rapid learning or the acquisition of a new skill is explained by *u mar nini pam*, 'he has eyes remarkably,' that is, he is very sharp. A friend of mine who was a cap-maker told me how he learnt his craft, as a youth, from a Dagban by carefully watching him at work. When he was young, he explained, he had 'very good eyes.' This conception of cleverness is intelligible in a society where learning by looking and copying is the commonest manner of achieving dexterity both in crafts and in the everyday manual activities.

It is hard to find any conscious human learning that does not include all three processes of listening, watching, and doing. Yet, it seems that cultures may differ in the degree to which one or the other is stressed, and in the degree to which one or the other is stressed in learning different *things*. Contemporary cultures, of course, have substituted reading for much of listening, and even of watching, since written directions accompanied by diagrams can replace watching. On the other hand, the American stress on "learning by doing" suggests an "action" approach to education. It seems possible that, while learning by doing may lead to an early mastery of, let us say, agricultural techniques, it may lead to a premature sense of mastery in painting, with consequent poor production. Belo and McPhee (Mead and Wolfenstein 1954) have given us exciting materials on children's painting and music in Bali, but no description of the actual learning process. One of the puzzling problems in education is the exciting quality of children's painting and its disappearance in later life. What happens to all the budding artists? Why do they abandon their art altogether, or discard its most original dimensions—as in Bali, for example? One factor is suggested here: that children who learn by doing develop a premature sense of mastery, and that later comparison of their own work with that of a mature adult artist leads to destructive self-criticism. In offering this hypothesis I am not unaware of the importance of institutional supports for art. What place does a creative artist have in industrial culture, anyway? And what scope is there for originality in Bali? The answer in both cases is, *little*.

II:31. By Listening

A great deal of learning involves listening, but this category II:31 applies only to learning situations that are *defined* as listening ones. Thus Fortes quotes a Tale man as follows (1938: 12):

> "If he listens will he not know, will he not acquire wisdom?" When children are very small. . . . they know nothing about religious things. "They learn little by little. When we go to the shrine they accompany us and listen to what we say. Will they not [thus] get to know it? . . . Whatever I do [my son] also sits and listens. Will he not get to know it thus?"

II:32. Question and Answer

The "question and answer" method is so common in American culture that it is not easy for Americans to imagine another in which the child is expected, not to ask questions, but to learn by passively watching, listening, or copying. Yet, we have seen that the Chinese stress watching (see also II:37) and that the Tale stress watching and listening. Among the Pilagá, the educational process includes a further interesting characteristic: Pilagá children learn a great deal simply by making incorrect statements that adults correct. For example, a child will point to an insect and give its name, and, if the name is incorrect, the adult will correct it.

II:34. By Doing Something on His Own

A child is said to be "doing something on his own" when, for example, after he has asked, "What makes clouds?" he follows an instruction to find the answer himself by going to an encyclopedia and other books on the subject. This category also covers the case of the Lepcha child who is given his own animals and plot of land to take care of (Gorer 1938: 108, 307).

II:36. By Accusing

"Young ears don't listen. Can't you look after your cattle properly, you good-for-nothings, you things-with-sunken-eyes . . ." is one example, from Tale, of educating through accusation (Fortes 1938: 14). It is also II:27*b*, education through ego-deflation.

II:37. By Following a Model

When a teacher plays a song, or the first note of it, on a musical instrument, and children try to follow it, singing, this is following a non-human model (II:37:2). But when the teacher beats time with her arm for the children, this is following a human model (II:37:1). Again, when the teacher writes on a blackboard and the children try to copy her writing, this is following a human model. Any instance of a child's attempt to follow this kind of direction is considered to belong in II:37. In Pettitt's language, it is "directed practice."

II:38. By Comparison

The category "By Comparison" has to do with those cases in which a child is educated through asking him to compare two or more objects, such as two lines of unequal length, or three colors like yellow, orange, and chartreuse.

II:39. By Filling in a Missing Part

Teaching "by filling in a missing part" is carried out by, for example, showing a child a book on language skills containing sentences with missing words, and requiring him to fill in the missing words.

II:43. Physical Manipulation

II:43:1. bodily manipulation

Mead and Bateson (1942) afforded an example of

"Bodily Manipulation" in describing how children learn to dance in Bali: the child's body is against that of the instructor, and the two move in unison, the child learning how to dance partly through making his own movements coalesce with the instructor's.

Gorer (1938: 305) says the following of the Lepcha:

> Children are taught work techniques by being instructed to copy their elders, by verbal admonition, or by having their arms held while they are put through the appropriate gestures.

II:43:2. BODILY MUTILATION AND OTHER PHYSICAL STRESSES

Bodily mutilation as an educational technique is common enough in primitive societies, and includes the piercing of lips and ears, removal of teeth, scarification, circumcision, sub-incision, and clitterodectomy. It would appear that man early made the discovery that, within limits, learning would be most strongly reinforced in the presence of anxiety, hence the inclusion of bodily mutilation in many tribal rituals in which fundamental tribal lore is taught to young men or women. The relation between mutilation and learning has many complexities, as can be seen, e.g., from the following about the Chagga (Raum 1940: 311):

> That the parental generation regards circumcision, not only as a test, but as an opportunity for cumulative punishment appears from the fact that any notorious mischief-monger is submitted to a severe trial. His circumcision is attended by those of his elders who bear a grudge against him. When the operator has made the preliminary incision, he is told to stop. Someone steps on the victim's big toe to find out whether he squirms and to beat him if he does. He is told to sing a song without hesitating or trembling. After some other boys have been circumcised, the operator is allowed to continue on the culprit, but before he is finished he is told: "Leave him for another while!" Only after a lengthy interval is the operation completed. In some cases a boy is under the knife for an hour or longer. The report of this torture is spread among the uncircumcised and stupefies them with terror. In consequence they willingly obey and honor their elders. . . .

Here the Chagga have contrived that circumcision shall be an *anticipated* threat, so that the ensuing anxiety may provide a motivation for learning. Circumcision, a physical stress, is accompanied by emotional stress.

The Chagga case opens up the general problem of the introduction of stress into the educational process. Pettitt (1946: 89) has the following to say about the functions of stress in the education of some North American Indians:

> The point to be made is that in the vision quest [a major educational experience]. . . . the objective was. . . . to produce an independent, self-confident, and self-reliant personality, buoyed up by an inner conviction of his ability to meet any and all situations. . . . The painful ordeals . . . strengthened his character, and supplied him with experience in withstanding physical suffering, which was . . . important in giving him self-assurance. . . .

Pettitt, abstracting from Teit's numerous publications on the Thompson River Indians of British Columbia, describes the Thompson River Indian boy's vision quest as follows (1946: 87–88):

> . . . When a boy's dreams became propitious . . . his vision quest began in earnest. As a ceremonial beginning, he was required to run, with bow and arrows in his hands, until bathed in perspiration and on the point of exhaustion, when he was made to plunge in cold water. This was repeated four times a day for four days . . . Although his first four days were consumed in running and bathing, the first four nights were given to dancing, singing, and praying, with little or no sleep, around a fire on some near-by mountain peak. . . .
>
> Having acted out the prologue, the boy then began work in earnest. He went on lonely pilgrimages into the mountains, staying away from home and eating nothing for from four to eight days on end. It was a common practise to schedule these pilgrimages in winter, so that the boy would not be tempted by berries and roots. During these vigils the boy usually took nothing with him but a fire drill and a sleeping mat. He intensified the effect of his fasting by taking herbal concoctions with a purgative action, and by poking long twigs down his throat until he vomited. . . . The boy continued this exhausting regime until he had a dream of some animal or bird which would be his protector through life. . . .

Pettitt summarizes also (1946: 101) some of Stern's material on the Lumi Indians of the Pacific Northwest of North America:

> The first objective of training is to give the boy confidence and make him fearless. He is sent out on dark stormy nights to perform trumped-up errands, such as fetching a bow or some other article from a friend or relative living at some distance . . . The status of childhood is made uncomfortable by depriving him of the best foods, discriminating against him, making him bathe in cold water, morning and night. At the slightest breach of this discipline, which he knows will end when he proves his manhood, his father becomes enraged, and may throw burning bark in his face. As he grows older the rigor of his regime increases. He is instructed to rub his body with cedar bark to toughen his muscles. His father tests his stamina from time to time by cutting gashes in his body, starting with the more calloused parts and working up to the more tender. He is stimulated to greater efforts by the warning that he will turn into a girl unless he watches out. In fact, these warnings are often taken so seriously that a boy rubs his breasts with sand until they bleed, or smashes the nipples between rocks to stop a fancied over-development.
>
> Finally, he is ready to make his quest. He goes to some secluded spot and seeks by his endurance to out-strip all other boys of whom he has heard, thereby winning the favor of the supernaturals. . . . If rocks assume strange shapes in the darkness, he must stand his ground, in fact run toward them and grapple with them . . . The boy may stay away from his village for a year or even four years. . . . through living alone he builds up a sense of self-sufficiency.

Thus, through isolation (see II:55) and the self-imposition of various austerities, the boy made himself physically and emotionally capable of withstanding pain, hunger, and thirst in later life. What happened, in addition, was an orientation of the personality away from childish things, a hardening of determination, and, most importantly, a consolidation of the culturally requisite conceptions of the world—in Radcliffe-Brown's terminology, a crystallization of the "collective sentiments."

Among the Tiwi of North Australia, physical and emotional stresses are combined in the educational process in a different way. There, initiation is taken over by persons who are strangers to the boy. This in

itself is frightening to him, but, in addition, the way in which the strangers appear on the scene is terrifying. Hart describes this vividly (1955: 134–35):

> Among the Tiwi of North Australia, one can see the traumatic nature of the initiation period in very clear form, and part of the trauma lies in the sudden switch of personnel with whom the youth has to associate. A boy reaches thirteen or fourteen or so, and the physiological signs of puberty begin to appear. Nothing happens, possibly for many months. Then suddenly, one day toward evening when the people are gathering around their campfires for the main meal of the day after coming in from their day's hunting and food-gathering, a group of three or four heavily armed and taciturn strangers appear in camp. In full war regalia they walk in silence to the camp of the boy and say curtly to the household: "We have come for So-and-So." Immediately pandemonium breaks loose. The mother and the rest of the older women begin to howl and wail. The father rushes for his spears. The boy himself, panic-stricken, tries to hide, the younger children begin to cry, and the household dogs begin to bark. . . .
>
> The father's rush for his spears. . . . is make-believe. . . . With the father immobilized the child clings to his mother, but the inexorable strangers soon tear him (literally) from his mother's arms . . . and, still as grimly as they came, bear him off into the night. No society could symbolize more dramatically that initiation necessitates the forcible taking away of the boy from the bosom of his family, his village, his neighbors, his intimates, his friends.

While Hart needlessly generalizes the use of force, and overestimates the extent to which in other parts of the primitive world education is shifted at puberty from intimates to strangers, the fright of the boys and the mock battle staged by their fathers are described by Warner (1958: 261), with variations, also for the Murngin, another Australian tribe. The point is that the initiation begins with massive fright stimuli which are repeated at strategic moments during the ceremony (see, for example, Warner 1958: 282). Presumably their function is to force a re-orientation of the boys' personalities.

It has been pointed out that education always involves a narrowing of the perceptual field to the universe selected by the culture. It has also been suggested that narrowing occurs partly through emphasizing only that cultural universe. But the important question then is: How is that cultural universe emphasized? Some answers to this question have been suggested in section II. For example, punishment for straying from cultural norms, and reward for consistently practicing them, are obvious devices for narrowing the perceptual field to the desired universe.

It would appear from the primitive North American, Australian, and Chagga data, that the massive application of pain to, and provocation of anxiety and other stresses in, primitive boys during periods of great solemnity, would serve, in general, to narrow the perceptual sphere. The Chagga technique of making circumcision an implied threat (II:16*a*) is a good example of a special use of anxiety for this purpose: any indulgence before initiation in behaviors not sanctioned by the elders might result in torture at initiation.

In American public schools there are no physical stresses comparable to those experienced by the Chagga, by the North American Indians, or by the Australians. Emotional stresses are, nevertheless, constantly operative in American classrooms. Outstanding, of course, is the ever-present fear of failure, which tends to make the student accept almost any idea. There are, in addition, more specific techniques for fixing cultural configurations in the student's mind, like teaching by holding up adult ideals (II:21), by having the children act in undifferentiated unison (II:22), and by using positive or negative assertion (II:24). For example, if the child has held up before him certain adult ideals as he acts in undifferentiated unison with a group of his peers, the emotional impact will reinforce commitment to the culture. The method of positive or negative assertion, II:24, is a kind of implied threat, which seems to say, "If you do not like [whatever the teacher wants you to like], you probably have something wrong with you; so you had better learn to like it." With respect to using ego-inflation (II:27*a*) or ego-deflation (II:27*b*), it seems likely that since a cultural experience that enhances the self-image will be rewarding, such an experience will serve to anchor the components of that experience in the child's personality; while, on the other hand, ridicule or contempt accompanying failure may make the child struggle hard to succeed. Of course, the experience may have the opposite effect, thereby laying the basis for culture conflict and change. This is true also of II:4, using punishment.

Before closing this section, it is necessary to indicate that there seem to be some physical stresses accompanying education, especially in literate cultures, which tend to act in an inhibitory way on some aspects of learning, perhaps while reinforcing others. For example, long hours spent sitting in one spot might render students antagonistic to subject matter but teach them self-control. This suggests that the imposition of such physical restrictions during education would be a screening device through which only the culturally most desirable persons could pass, i.e., those who could combine attention to subject matter with self-control. Thus all the rules of order in school, to the degree that they govern physical behavior, are, along with the curriculum, mechanisms for separating the children into good learners and poor ones.

As one glances over this list of educational methods that is section II, one cannot but be struck by their mere number. The reason for the number is that since humans have no innate techniques of adaptation to the environment, including culture, they have to learn them. The problem for *Homo sapiens* was twofold, for not only was the *acquisition* of knowledge through learning essential to his adaptation, but he had also to devise *methods* of teaching what he knew to his offspring. Thus a further problem arose out of his necessity for devising different methods for teaching different bodies of knowledge. The result was a lengthening list of teaching methods as knowledge increased.

The length of the list raises a general question as to the relation between number of methods and level of cultural complexity. Some answer to this question has been attempted (Henry 1955*a*: 199–202), and the suggestion made that, as the number of cultural items to be learned increases, the number of teaching methods increases also, but that the time expended to educate about each item probably fluctuates too (see section

XII, below). Actually, what we seem to have in contemporary American culture, as compared with primitive societies, is a greater number of teaching methods, less time allotted to each subject taught, but an enormous amount of time spent in formal instruction. Meanwhile, the American child is repeatedly placed in the position of having his "machine jammed" (II:8:1). Jamming the machine is so characteristic of contemporary culture because, given the enormous amount of learning expected of a child, there has not been sufficient improvement in teaching methods, even though the catalogue of them seems extensive. Modern man's inventiveness of cultural content appears to have outstripped his ingenuity in devising methods to communicate that content. Students whose failure compels them to drop out of school or curtail their schooling are thus, in part, casualties of cultural lag—of the failure of teaching methods to keep pace with content.

III. WHO EDUCATES?

III:1. Males or Females?

The revolutionary change in the United States from male to female teachers occurred in the 1860's during and after the Civil War. Even before this, American women had been breaking the socio-economic taboos that blocked their entrance into the labor force, but with the increased use of women workers by the government and the rapid expansion of American industry after the war, with consequent more lucrative opportunities available to men, women began to flock into the educational system (Calhoun [1945] II:359–61). At the same time, the curriculum became a "common gender" curriculum—not "masculine" or "feminine." That is to say, the American public school curriculum became more and more shaped to fit the requirements of both males and females rather than of males only. Thus there is a relationship in the United States between the development of a common-gender curriculum and the lack of sexual specialization in teaching: though most elementary-school teachers in America are females, males are very much desired and they are heavily represented in high schools and colleges.

III:2. Relatives or Others?

Another feature of pre-literate education has been the concentration within the kin group of responsibility for educating the young (Fortes 1938: 5). The child's mother's brother and father's sister (Pettitt 1946: 15–24) have often assumed this responsibility. Meanwhile, there appears to be a systematic relationship between the content of education at any given moment and the kin category, or categories, that assumes responsibility for it (Henry 1955*a*: 191–92). One of the commonest is the responsibility of the same-sex parent for training in occupational techniques, and the responsibility of the wider kin group for training in morality. In contemporary America, neither schools nor parents are required by law to teach morality, though the social conscience still expects parents to assume this responsibility. Occupational training, on the other hand, has been handed over to non-kin agencies, the reverse of the more ancient cultural pattern.

III:3. On Which Age Group Does the Burden of Education Fall?

III:3:1. peers

Many references to peer education are scattered through Fortes' penetrating study (1938). In this respect, Chagga boys emphasize masculinity (Raum 1940: 241). Egyptian boys are sensitive to standards of "maturity," and are bitterly scornful of a boy whose behavior does not come up to his age level (Ammar 1954: 128). But the educational responsibilities that children's peer groups had in pre-literate and peasant cultures have tended to diminish with the emergence of the common-gender curriculum, the approximation of male and female roles, and the handing over of occupational training to non-kin.

Peer education seems most prominent at all cultural levels in the area of conformity to cultural standards. In pre-literate and peasant societies, the peer group is a major force against delinquency. In contemporary society, the peer group seems split on this issue: it is a major support of rebellion against parents (and hence of the cultural standards they represent), while, at the same time, it does use its power to assist conformity to accepted adult standards of morality (Hollingshead 1949). It would seem that this capacity to take rebellion as a standard of conformity to peer-group mores is related to the fact that *in the long run* children in contemporary culture will not, as in many peasant and pre-literate cultures, receive their economic foundation in life from their parents.

III:4. Is Education by "Successful" People?
III:5. What Rewards Accrue to the Educator?

The categories "Is Education by 'Successful' People?" and "What Rewards Accrue to the Educator?" are closely related. For example, Williams ([1849] I:426) says of Chinese teachers that they are "unsuccessful students or candidates for literary degrees" but that, nevertheless, "When a boy comes to school in the morning he bows first before the tablet of Confucius, as an act of worship, and then salutes his teacher . . . ." for the teacher taught the sacred writings of Confucius and his disciples. Chiang (1952: 79–82) tells about the reverence with which his teacher was treated and the absolute authority over the children granted him by parents. Thus there has been no necessary connection between success, as measured by worldly standards, and the *deference* accorded a teacher (III:5:1, 3). In the *shtetl* (Zborowski and Herzog 1952: 89) the *melamed*, the teacher of the youngest children, was looked down upon as a man who, because "he has fallen into his profession because he has failed elsewhere," is driven to sell what should be given freely, i.e., learning. Nevertheless, his word was law in the school, and there was no appeal to parents from his cruelty. In eighteenth-century Germany (Bruford 1935: 247–50), teachers were of low status and were often treated like servants. In nineteenth-century England (Bayne-Powell 1939: 69), the outstanding requirement in schoolmasters was "humility," and they were "despised." In Egypt, on the other hand, the Sheikhs were accorded great deference, a function of the fact

that "they are the perpetuators of the Holy Book" (Ammar 1954: 211). From all of this, four factors seem to emerge. (1) There is no necessary connection between the success of a teacher according to worldly standards and the deference granted to him. (2) There is no necessary connection between the deference granted a teacher and the authority he, compared with parents, wields over children. (3) There seems to be a connection between the sacredness of knowledge and the deference accorded a teacher in the community as a whole. (4) Europe and the United States have a recorded history of low esteem for schoolteachers.

In the light of the foregoing, we can obtain some understanding of the reason for the poor pay received by American teachers. The low esteem in which teachers have been traditionally held in the United States continues today (Kahl 1957: 73), and low esteem is usually accompanied by low pay. It is further suggested that the reason for the disdain of teachers is the detachment of American education from the "sacred" (Durkheim 1947), i.e., the lack of any deeply felt social consciousness of the aims of education.

III:8. Is the Educator of the Same or of a Different Social Group from That of the Person Being Educated?

The issue of coincidence or lack of coincidence between the social group of the educator and of the educated of course vigorously confronts anthropology in situations of acculturation, but, since it constitutes a chapter by itself in the history of education, it will be barely touched on here. Malinowski (1943: 649–65) has discussed the issue with insight and feeling in connection with Africa, pointing out that missionary education "undermined and destroyed" the native culture, while holding out a promise of equality with Europeans that was, however, not kept. Thompson (1943: 720) says that a committee appointed to inquire into British educational policy in Ceylon found that the policy there had done nothing more than produce

> a class of shallow, conceited, half-educated youths who have learned nothing but to look back with contempt upon the conditions in which they were born and from which they conceive that their education has raised them, and who desert the ranks of the industrious classes to become idle, discontented hangers-on of the courts and the Public Offices.

In the United States, arbitrary efforts to educate Indians along lines laid down by the federal government's Office of Indian Affairs had for many years an inglorious outcome. Macgregor (1946), concentrating on the disastrous consequences for Dakota Indian children, emphasizes (1946: 134–37): (1) the children's fright at encountering large numbers of strange children in the government boarding schools maintained for Indians; (2) fear, by these non-competitive Indian children, of the competitive situation created by the White schoolteachers; (3) fear of White teachers because Whites had always been looked upon as enemies of the Indian; (4) severity of school discipline as contrasted with the more permissive atmosphere of Indian family life; (5) linguistic difficulties, so that many children could not even understand "the teacher's simplest directions." As a consequence, many children "refuse to enter into competition, withdraw from activities, and sometimes become unwilling to make any response." Children would withdraw into themselves or run away from school. They were often overwhelmed with shame when they could not win in a given situation. Leighton and Kluckhohn (1948) discuss similar conditions in Navaho schools.

Study of these and similar situations, and Hollingshead's study (1949) of the relation between social class and education in a small American city, document the fact that a controlling social group, whether it be Whites over Negroes (Warner, Havighurst, and Loeb 1944), Whites over Indians (Macgregor 1946), a colonial power over its colonial peoples (Malinowski 1943; Thompson 1943), or the higher classes over the lower (Hollingshead 1949), tends to organize the educational system so as to strengthen and maintain its own position.

The works of anthropologists tend to stress the repressive and destructive effects on the subordinate group of education by the dominant group. Malinowski (1943), however, though giving the White man's education of the African little quarter, mentions that missionary education did start the African on the way toward dealing with the new civilization. Sometimes subordinate peoples exposed to modern education have extracted benefits from it, ranging from increased capacity to earn a living in the modern milieu, to the ability to engineer and sustain a social revolution, as in contemporary Africa. Leonard and Loomis (1941) have shown that while education of Spanish-Americans by Spanish-American teachers in New Mexico accomplished little because of the teachers' poor training, Spanish-American boys enrolled in Civilian Conservation Corps and National Youth Administration camps run by non-Spanish-Americans emerged well trained in reading, writing, and other academic skills and returned to their native towns with enhanced status.

IV. HOW DOES THE PERSON BEING EDUCATED PARTICIPATE? (WHAT IS HIS ATTITUDE?)

All the following attitudes of children toward education are known exclusively from literate cultures: "rejecting; resistive" (IV:2), "bored; indifferent" (IV:3), "defiant" (IV:4), "inattentive" (IV:5), "diversion to peers" (IV:27), "disruptively" (IV:33). These seem to stem most generally from the child's failure to feel an immediacy in the relation between what is being taught him in school and the rest of his life. Studies of education in pre-literate cultures emphasize that knowledge is *sought* as a guide to an inevitable life-role. This contrasts, as Mead (1943) has pointed out, with literate cultures, where the child is subjected to compulsory education but may not see its relevance to his future role as an adult, or to his immediate life outside of school. More concretely, in non-literate cultures the child is always in close physical contact with the matured activity that he is merely learning. In literate cultures, the school itself, and what he is learning in it, are physically separate from adult *application* of the learning: offices and other places where writing and arithmetic are *used* are separate from the school where the child is learning how to read and add.

Spiro was struck by the apparent boredom, indifference, and inattention, of many children in the *kibbutz* high school (1958: 296–97):

> Taking a random sample of twenty-four observational protocols, we rated the students' apparent interest on a simple interested-disinterested dichotomy. Lively group participation, careful attention, intelligent questions, and so on, were taken as indications of interest, while such statements in the protocols as: "The children looked bored and sleepy"; "They daydream, doodle, play with objects in their desks . . ."; "The children are apathetic and listless; they do not participate in the discussion. They look bored. At least three heads on the desks"; . . . [etc.] were taken as indications of disinterest. On the basis of these simple criteria, fifteen of the twenty-four sessions were judged to elicit the students' interest, and nine were rated as sessions in which they were disinterested or bored.

It seems likely that in the *kibbutz* this behavior stems from the same factors as in other literate cultures.

IV:6. Social Closeness of Teacher and Child; IV:7. Social Distance of Teacher and Child

Spiro (1958: 263) ascribes "informality" in the *kibbutz* primary school largely to the lack of "social distance" between teacher and children: the children know the teacher personally, and see her in many roles outside of school. "Social closeness" is thus viewed in terms of long-standing continuous interaction. But the term may be used also to describe less permanent interactional situations, as in American classrooms, where the children see the teacher only during class periods. In the American classroom, social distance may be gauged in terms of certain kinds of behavior peculiar to the classroom, that is, the following categories in section IV:

IV: 15. Through making independent decisions and suggestions
17. Through spontaneous contributions or other demonstrations not precisely within the context of the lesson
18. Through spontaneous contributions within the context of the lesson
20. Spontaneously humorous
21. Spontaneously expressive
22. Approaches teacher physically
23. Mobile—free
32. Corrects teacher
45. Uses teacher's first name
46. Calls out to teacher

That is to say, the extent to which children make independent decisions and offer suggestions to an adult mentor regarding the conduct of a lesson or other activity, the level of general mobility or of approach to the teacher's person, and the frequency with which children call out to the teacher and use his first name (rare in American culture outside the nursery school) all bear upon social distance. This term refers to a bundle of behaviors that are related to how secure, relaxed, and accepted children seem to feel in a teacher's presence, and he in theirs.

Since the children's behavior occurs in interaction with the teacher, it is necessary at this point to consider the relevance of these categories in section IV to certain categories in section V. In section V—"How Does the Educator Participate? (What is His Attitude?)"—the categories most relevant to the problem of social distance would appear to be:

4*b*. Integrative [5]
7. Enjoys correct response
10. Seeks physical contact with person being educated
11. Acceptance of blame
14. Encouraging
16. Relatively mobile
18. Personalizing
21. Accepts approach
23. Accepting of child's spontaneous expressions
25. Humorous
26. Handles anxiety, hostility, discomfort, etc.
27. Acts and/or talks as if child's self-image is fragile
29. Defends child against peers
30. Responds to non-verbal cue other than handraising

That is to say, when American *children* display behaviors indicating their feeling of social closeness to the teacher, the American teacher will probably be found to be "integrative." He will show pleasure at correct responses, occasionally pat a child, be encouraging, move about the room, make frequent use of the children's names, let them come close to him, accept outbursts of joy, sorrow, or anxiety, deal appropriately with emotional problems as they arise, be sensitive to the children's feelings, defend a child who comes under verbal or physical attack by another child, and be perceptive enough of cues emanating from the children so that he will respond to frowns, smiles, tenseness, etc.—in other words, not wait for a question or a raised hand before responding. Thus social closeness can be expressed as a pattern of classroom behaviors quite apart from whether the children see the teacher after class periods.

Spiro describes *kibbutz* behaviors that in American schools would also indicate closeness (1958: 264):

> Students leave the classroom at will—to get a drink, to go to the toilet, or for any reason which they deem important. Similarly, they may leave their desks without permission—to get supplies from the cabinet, to sharpen a pencil, and so on.
>
> They may talk among themselves [IV:27] both during oral lessons and while working privately at their desks; some hum or sing to themselves while writing or studying.
>
> A second expression of informality is readiness of the children to criticize the teacher when they feel he is wrong.
>
> Students . . . address their teachers by their first names and the latter address their students as chaverim, "comrades". . . .

The *kibbutz* is much more tolerant of random behavior than the American classrooms studied:

> A final expression of classroom informality is the poor discipline. . . . particularly in the second through fourth grades in the primary school, and the eighth through tenth grades in the high school—and which often results in utter chaos [Spiro 1958: 264].

Such behavior would be considered "disruptive" (IV: 33*a*) in most American classrooms, though Henry (1959) has described occasional approval of it in suburban schools. Spiro (1958: 263) feels that this extreme informality is due to lack of social distance between teacher and child; yet, though in primitive cultures the social distance between teacher and pupil is, with certain exceptions (Watkins 1943), very small, I have not found in primitive culture such generalized random behavior *when the children are receiving systematic in-*

struction in cultural skills. The most general explanation of the occurrence of random behavior is that adults permit it—if, indeed, they do not encourage it—by failure, as in the *kibbutz* and in some American suburban schools, to establish a clear locus of authority. Both in the United States and in the *kibbutz*, this is an expression of a special interpretation of democracy. On the other hand, in the suburban American schools studied by Henry (1959), the chaos itself seems to be a value: random behavior is believed to be creative behavior. Finally, it is likely that lack of unity in the social sphere makes its contribution to unruliness, for when children do not see the relevance to their life-roles of what they are doing, boredom and inattention (IV:3, 5) may ensue.

IV:11*a*. With Inappropriate Laughter

"Inappropriate Laughter" signifies laughter that occurs in a context not socially defined as humorous, or laughter that is not part of a formal sanction pattern. The following from an American fifth-grade schoolroom is illustrative:

> The child at the board stares at $\frac{2}{3}$ minus $\frac{2}{3}$. There is a faint titter, snicker, giggle or something. . . . as the child stares, nonplussed by the problem.

Also illustrative is the following from a spelling lesson in a fourth-grade class:

> The child writing "Thursday" on the board stops to think after the first letter, and the children snicker. He stops after another letter. More snickers.

At the same time, it is not quite correct to say that failure is not "socially defined" as humorous *by the children;* or that, for children in American society, laughter at failure is not part of the *children's* formal sanction pattern. Since it occurs so frequently among children in our research, it must be assumed to be a sanction within the children's group, and, therefore, to be inappropriate only from the adult point of view. This does not mean that adults in American society do *not* take pleasure in other people's failure (Henry 1957*a*).

IV:11*b*. Ridiculing Peers

Ridicule is closely related to laughter as a social sanction against those who fail to come up to cultural demands. Pettitt says ridicule is "world-wide in distribution" (1946: 50), and makes the important observation (1946: 53) that in primitive North America "ridicule follows and supplements praise rather than vice versa. Praise is more frequently used at all age levels, and the ratio of praise to ridicule is relatively greatest at the younger ages." The materials from contemporary American public grade schools do not parallel those from primitive North America. Our records show that, in American primary public schools, children do praise one another's work, but that ridicule, as expressed in spontaneous tittering, is more frequent. On the other hand, it is rare to find in these schools a ridiculing *teacher,* or one who laughs at the failure of one of her students.

The impression one derives from the literature on both literate and non-literate cultures is that ridicule is more common within the peer group than across age lines, and that it is less common for a younger person to use it toward an older person than the reverse. This latter is understandable since the younger is more often the subordinate both in learning situations and with respect to the sanction system.

Among the numerous penetrating insights in Pettitt's work is his observation that ridicule did not occur in a random way among the Indians of North America. He says that "the right to ridicule with impunity was generally limited," and that there was usually a "privileged" group of ridiculers (like certain relatives) for every person (1946: 50–52). Thus ridicule, probably because of its damage to the self-image and its great potential for generating hostility, was strictly controlled. There is no doubt that the importance of controlling ridicule was a brilliant psychological discovery by primitive man, and one wonders, therefore, why, once he had made that one, he did not go on to further triumphs. Speaking impressionistically again, it seems that they did, but that we need another Pettitt to comb the literature to find them, for these discoveries occurred in a scattered, unsystematized way, some in one tribe, some in another.

IV:13. Overt Docility

Ammar says of education in Egypt (1954: 127):

> The keynote to the educational process is the eagerness of the adults to create a docile attitude in their children and thus make them acquire filial piety. The children readily accept the authority of their seniors, whether in work or play, and they endeavor to avoid their anger.

This is *not* the type of docility to which IV:13 refers. Henry (1955*b*) describes "overt docility" as a child's renunciation of his own ideas in order to please the teacher. Two examples from a fourth-grade class in an American public school will illustrate the point:

> During the art lesson Mrs. Mintner holds up a picture and says, "Isn't Bobby getting a nice effect of moss and trees?" The children utter ecstatic Ohs and Ahs.

> The children have just finished reading the story of *The Sun, Moon, and Stars Clock* (Savery 1942) and Mrs. Mintner asks them, "What was the highest point of interest, the climax?" The children tell her what they think it is. The teacher is aiming to get from them what she thinks it is, but the children give everything else but the answer she wants. At last Tom says, "When they capture the thieves," and Mrs. Mintner asks, "How many agree with Tom?" A great flurry of hands goes up.

IV:29. Disjoined Hand-Raising

"Disjoined hand-raising" has been discussed at some length under I:10:2 ("Use of the Mind: Disjunction"). The "disjoined hand" is the hand that is kept raised for no objective reason: the teacher has asked no question, nor created any other situation that calls for hand-raising, but the child's hand is up because he is detached from the situation and does not know what is going on.

IV:34. By Carping Criticism

Henry (1957*a*) has discussed the phenomenon of "Carping Criticism" in public elementary-school classrooms. Carping criticism ignores the virtues in a work and concentrates destructively on petty details. For example, when a student reads to the class a little story

he has composed, his classmates may ignore the good things in the story and pick out insignificant items to devalue. Often this occurs as a miscarriage of the idea that children should be taught to think "critically," the teacher herself inadvertently starting criticism of this kind (see V:36).

Carping criticism does not appear to occur in *kibbutz* schools:

> . . . The emphasis on group criticism can potentially engender competitive, if not hostile feelings among the children. Frequently, for example, the children read their essays aloud, and the others are then asked to comment. Only infrequently could we detect any hostility in the criticisms of the students, and often the evaluations were filled with praise [Spiro 1958: 261].

Thus, *kibbutz* children show more IV:35 ("Praising Work of Peers") than IV:34; and this is probably related to their great group solidarity within a markedly co-operative social structure.

IV:37. Attempts to Maintain Order

In some suburban schools in the United States, where the ideology of permissiveness has penetrated deeply so that the classroom becomes very noisy, the tolerance limits for disorder are at times passed for some children, and they spontaneously "Shush!" (i.e., to quiet) their peers. This exemplifies what is meant by "Attempts to Maintain Order," and raises the interesting problem of the tolerance of different children for disorder. In the language of communications theory, the question would be, "How much noise can different persons tolerate in the communications system before the messages coming to them become completely blurred?" The problem of motivation is also involved here, for some children might not care how much noise there is in the system because they are not interested in the messages anyway. From the standpoint of the teacher, the issue would seem to be, "How much noise can a child tolerate in the communications system before messages are lost to him or before he feels incapable of competing with the noise?" These problems have been taken up by Henry (1955*a*).

IV:42. Attempts to Control the Class

The category "Attempts to Control the Class" differs from "Attempts to Maintain Order" (IV:37) in that its referent is not the teacher but the child. The focus is not on a teacher's efforts to maintain order, but rather on one child's efforts to get other children in the educational situation to do what he wants them to do. An example from a fourth-grade class in singing will illustrate the point:

> The children are singing songs from Ireland and her neighbors. . . . While the children are singing some of them hunt in the index of the song book, find a song belonging to one of the countries, and then raise their hands before the previous song is finished, in order that they may choose the next song to be sung. The index gives the national origin of each song.

When, in this situation, the teacher calls on a child whose hand is raised and accepts his selection of a song, the child has controlled the other children, because they have to sing his song. This category differs also from III:3:1, "Peer-Group Responsibility for Education," because in the latter we are concerned only with whether or not instruction is given by the peer group, whereas in IV:42 we are interested in whether or not a child attempts to impose his will on a learning group.

V. HOW DOES THE EDUCATOR PARTICIPATE? (WHAT IS HIS ATTITUDE?)

V:1. Eagerly

No anthropologist has ever asked whether adults in non-literate societies enjoy teaching. This must be because instructing the young in the tribal ways is as natural as breathing: the adults have a vital interest in the children they teach, and they often seem to have even a broader interest in the tribal existence as a whole. While Dubois (1944) and Raum (1940) give some evidence to show that children outside of Western culture can be reluctant to learn what they are supposed to learn, the over-all impression gained from reading the literature on non-literate cultures is that children appear to want to learn tribal ways, and that adults take the children's role as learners, and their own as educators, for granted. But this is only impression, for anthropology has not explored systematically the problem of the eagerness of the primitive teacher to teach, or, indeed, of the primitive child to learn.

In contemporary culture, teachers have no kinship or other compelling motivations for eagerness in their work, and there arises in the study of classroom learning the problem of discovering whether such a teacher enjoys his occupation and whether he demonstrates it in class. It is suggested that observations focused on the sub-categories under V:1 in the outline, and on the following group of categories indicating social closeness, would cast light on this matter:

V: 4*b*. Integrative
- 7. Enjoys correct response
- 10. Seeks physical contact with person being educated
- 16. Relatively mobile
- 18. Personalizing
- 21. Accepts approach
- 22. Repels approach
- 25. Humorous
- 26. Handles anxiety, hostility, discomfort, etc.
- 27. Acts and/or talks as if child's self-image is fragile
- 30. Responds to non-verbal cue other than hand-raising

V:11. Acceptance of Blame

The category "Acceptance of Blame" would seem to apply more to literate than to non-literate cultures, and is particularly relevant in the kind of "democratic" classroom atmosphere peculiar to the United States. The category would cover a situation where something goes wrong in the conduct of the lesson, the children tell the teacher it is his fault, and he accepts the blame.

V:12. Putting Decisions up to the Children

Spiro (1958: 264) describes decision-making in the *kibbutz* school as follows:

> The teacher, furthermore, generally consults with his students, rather than informing them of decisions he had made

independently. Even in the Grammar School, for example, the teacher chooses a project only after consultation with the class. It is true that she presents them with the suggestions from which a project is to be chosen, but the final choice rests on the decision of the class. An even more "democratic" procedure is adopted with respect to the writing of essays for which the children themselves suggest the topics.

In this type of situation where the teacher puts decisions up to the children, there is always the problem of whether such action by the teacher is democratic or *pseudo*-democratic. In *pseudo*-democratic action, the teacher, by suggestion or by limitation of the area of selection, can actually bind the act of choice while making it appear that it has been free. Henry (1959) has described such a situation in one American elementary school where a teacher said his children themselves set up the behavior rules, but where, actually, they did so under his direction, so that the rules were in the end what he wanted them to be. Placing decision-making in the hands of the children is not characteristic of American public elementary schools. Even cases of pseudo-democracy, such as that described by Henry, would appear to be infrequent.

V:18. Personalizing; V:19. Depersonalizing

The categories "Personalizing" and "Depersonalizing" refer largely to the way teachers call on students in class. It has struck our observers that teachers who impress them as being aloof from the children frequently will not use the children's names in calling on them, but, rather, use some impersonal device such as those listed in the outline under V:19. Nevertheless, this is far from being an established correlation: some teachers who appear to be bitterly hostile to their students make frequent use of their personal names, while others who seem much closer to the students use the techniques listed under V:19. The following, from an eighth-grade class in the United States, provides an example of a hostile teacher who generally uses the children's names:

> Cyril reads. He stumbles and mispronounces the word con'-tent. After three attempts he pronounces it con-tent'. Teacher says, "Cyril, do you or don't you know what you're reading?" She emphasizes "do you" or "don't you" as she gives Cyril a sharp look. "Are you making up words to suit yourself?" Cyril looks at the teacher, smiles, then lowers his head, and reads on. He comes across a sentence stating that "Interest is our first important point," but he reads it, "Interest is one of our most important point." The teacher raises her voice as she looks at Cyril directly, and says, "Don't add words that are not there. Alright, Jerry, you read for us." Jerry reads softly and rapidly, and the teacher says, sternly, "Open your mouth." As she says this she opens her own mouth in order to say each word distinctly. Jerry stumbles over the word cumulatively but pronounces it correctly. . . .
>
> A boy reads smoothly. He has no trouble in pronouncing the word pinioned. The teacher interrupts him to ask, "What do we mean when we say pinioned?" The boy says, "tied down," and the teacher asks, "Are you sure?" The boy shrugs his shoulders and smiles as he slowly writes the word on a piece of paper in a half disinterested manner. The teacher says, "That's why we don't understand what we read. What's the use of copying the word and looking up the meaning later. It is now that you need the meaning, to give the story some sense." She looks around the room and calls on Antoinette who had her head down on her open book. "Antoinette, you tell us all about it, since you know so much; (pause) or is it that you are too tired or too old to look?"

It is to be observed that though this teacher calls the children by name, she is hostile, ridiculing, sarcastic, and belittling (V:15) and, also, that she resents an incorrect response (V:8). She is also irritable (V:20), discouraging (V:13), and acts as if the child's self-image is irrelevant (V:28). Further, it would appear that the process is painful to the children (IV:8), and that their frequent stumbling is evidence of anxiety (IV:28), feelings of inadequacy, (IV:39), and machine jamming (II: 8:1).

The following provides an example of a non-hostile teacher who, nevertheless, often does not use the children's names. The observations were made in a sixth-grade American classroom:

> The teacher says, "Mike, how is your eye?" and Mike replies, "Fine today." The teacher says to the class, "First I'd like to talk to you about some work in vocabulary that you handed in and on which you made some mistakes." She goes to the board and writes the words our, are and or. She now says, "Let's have some sentences; first with are." She points to a girl at the front of the room, and the girl makes up a sentence, "Are you going too?" Teacher says, "Yes. Another." She points to a boy, who makes up the following sentence, "Tom and John are going to town or for a ride." The teacher says, "Good. I'm glad you used or in there too." She points to a girl, who says, "I or Jim are going to the show." The teacher says, "How did you say that? Which did you put first?" The child says, "I or. . .Oh! Jim or I are going to the show." The teacher says, "O.K., that's better. You all seem to know how to use them right today."

We may notice here that this teacher shows solicitude for a child's sore eye (V:4*b*), that she is polite (V:6) in phrasing her requests to the students, and that she rewards correct responses (V:34, II:5) and seems to take pleasure in them (V:7). To anticipate discussion a little, this teacher attempts to be "ego-syntonic" (XI:1:1).

V:21. Accepts Approach; V:22. Repels Approach

Children in American schools, especially in the lower grades, often attempt to be near the teacher. Categories V:21 and V:22 are meant to take account of whether or not the teacher accepts this.

V:23. Accepting of Child's Spontaneous Expressions

The following, observed also in the sixth-grade class used as an illustration under V:18 and V:19, illustrates the category "Accepting of Child's Spontaneous Expressions." The children have been answering questions about a story they have read, and they are to be graded on the number of correct answers; the teacher is about to tell them the grading system:

> "Now I'll tell you the bad news," she says. Several of the children moan and groan, and the teacher says, "It's not so bad. Take off 16 for each one wrong." The children moan some more. . . . The teacher says, "If you have one wrong your score is 84, two wrong, you have 68, etc." (She continues with the scores.) A girl says, "Why don't you give us two points if we get 68 so we will have above failing?" The teacher smiles and says, "If you miss six you get zero." A girl says, "Ouch, that hurts. I hope no one gets that," and the teacher says, smiling, "I do too."

The spontaneous expressions of the children all stem from their anxiety about the outcome of the grading,

and the teacher accepts these expressions. Of course, not all spontaneous expressions stem from anxiety; some are merely opinions elicited by the lesson or observations about things in general (IV:17, 18). In this teacher's acceptance of the spontaneous expressions of the children, there is also a manifestation of V:26, her ability to handle their anxiety without becoming annoyed and repressive. Obviously the categories in the outline are not mutually exclusive.

V:29. Defends Child against Peers

The category "Defends Child against Peers" was developed to take account of situations in which the teacher defends a child, not so much from physical attack, but against verbal attacks, which are the major expression of internal aggression in children's classrooms in the United States (Henry 1957*a*). The following example of a teacher's so defending a child is from observations made in a fifth-grade classroom. As one child after another stands up before the class and reads a little story he has written, the other children, reinforced by the teacher's critical attitude (V:36), proceed to demolish his work with trivial, carping, criticism (IV:34). In spite of the fact that the teacher, with a mistaken notion of what critical thinking is all about, consistently fails to praise the children's work (V:36), she does, very occasionally, defend a child against his carping critics:

> Harriet says that in Mae's story of "Custard the Lion" Mae said " 'most bravest animal' and that isn't very good English." The teacher then says, "No it isn't, but sometimes in stories for little children they say things like that. . . ." Victor reads a story called "The Unknown Guest". . . . The teacher asks the class, "Are there any words that give you the mood of the story?" Barbara says, "He could have made the sentences a little better. . . . [After a long carpingly critical discussion of Victor's story by the children] the teacher says, "We still haven't decided about the short sentences—perhaps they make the story more spooky and mysterious."

V:34. Praises and Rewards Realistically; V:35. Praises and Rewards Indiscriminately

The categories "Praises and Rewards Realistically" and "Praises and Rewards Indiscriminately" must be considered in connection with V:27, the teacher "Acts and/or Talks as if Child's Self-Image Is Fragile," for the cause of indiscriminate praise in American schools is, in considerable part, fear of hurting a child's feelings. Thus, at a polar extreme from the teacher who never praises, but is only silent or critical, is the teacher who says everything is good. Such a teacher would, in a so-called[4] art lesson, praise all the paintings as "fine," "beautiful," and so on. While V:35 is related to V:27, it is related also to VIII:5, "Ignorance or Error of Teacher," as a limiting factor in learning, for most elementary school teachers do not know how to teach art. Since they know so little about teaching art, and possibly about art, their failure to praise or criticize with discrimination is understandable. Meanwhile, children with talent might be discouraged by hearing everything praised, whether it was actually good, bad, or indifferent. Thus indiscriminate praise becomes inadvertent discouragement.

V:42. The Inclusive Plural

"The Inclusive Plural" refers to a practice, widespread among teachers at all levels in the United States, of including themselves in statements and instructions meant only for their students. Thus a teacher, referring to the students' unfamiliarity with the use of quotation marks, says, "We haven't learnt to use them yet." It seems that the function of this "we" is to diminish the status-gap between pupil and teacher.

A preliminary survey of education in non-literate societies yields the impression that the following attitudes are found among teachers there as well as in American culture:

V: 4*a*. Dominative
4*b*. Integrative[5]
7. Enjoys correct response
13. Discouraging
14. Encouraging
15. Hostile, ridiculing, sarcastic, belittling
20. Irritable
27. Acts and/or talks as if child's self-image is fragile
28. Acts and/or talks as if child's self-image is irrelevant
34. Praises and rewards realistically
38. Does not punish incorrect answer or poor performance

Other attitudes enumerated under this section V may be present in non-literate societies also, but relevant information is still so scant that one must hope that future studies will be more sensitive to this field of research.

VI. ARE SOME THINGS TAUGHT TO SOME AND NOT TO OTHERS?

The question, "Are some things taught to some people and not to others?" raises the issue of the apportionment of the contents of a culture among its members. For, if some things are, for example, taught to girls, and others to boys, it can only be because when the young people are mature men and women they will be responsible for different things in the culture. One obvious difference between men and women with respect to apportionment is in the work men and women do, and from this has arisen the classic conception of the sexual division of labor. However, not only labor but everything else in a culture is apportioned, hence the educational process provides for much more than the division of labor. Further, it varies not only with sex but also with age, social class, and other categories of persons, for each one of these carries a different part of the cultural baggage.

As a matter of fact, the concept of apportionment implies also the broad issue of the philosophical ideas that lie behind it and ultimately determine the educational process. If the pivotal problem in a culture is man's relation to God, then religious instruction will

[5] Actually V:4*a* and 4*b* are very complex. H. H. Anderson (Anderson and Brewer 1945, 1946; Anderson, Brewer, and Reed 1946) has made the fundamental contribution to the elucidation of this problem.

play an important role in the education of all. But if, as in the eastern European *shtetl* culture, the pathway to God is the prerogative of males (Zborowski and Herzog 1952), then males alone will receive formal religious instruction.

All cultures have, in addition to a general conception of man's relation to the world, some ideas about the inherent nature of children, and such ideas affect education. For example, since both nineteenth-century Calvinists (Sunley 1954: 159) and twentieth-century Lepchas (Gorer 1938: 305) thought children were born bad, their educational processes focused on eradicating the badness. In the same way, status systems are typically buttressed by ideas, and education is shaped to fit those ideas. One of the most widespread status differentiations is between men and women. Since in the Chinese, Hebrew, and Indo-European traditions men have stood for intellect and strength, and women for emotion and weakness, the cultural baggage has been apportioned accordingly, and the educational process has differed for boys and girls.

Data is abundant in the area of differential education by sex, for the sexual division of culture has, throughout human history, been one of the most obvious and dramatic aspects of apportionment. In the West, it has been a matter for controversy. The issue pivots on a central contradiction, namely, that culture has striven *both* to unite and to separate the sexes, at the same time, thus *their unity was sought through dividing them*. The line of division was at the separation of functions, and it was this line that was *also the line of unity*, for those functions were complementary. As long as men and women do different things they need each other, and this need adds to the ties of matrimony and children. A Sirionó man without a woman cannot hunt, because she makes the string for his bow (Holmberg 1950: 14)!

So, though it is correct to say that men and women are taught different things because they have different things to do, the fundamental point is that they *must* have different things to do. From this stems the pressure to keep their educational areas separate.

In the ensuing paragraphs, stress will be placed on status differences as expressed in education, but it must be borne in mind that at the base of such status differences there is always a philosophy of the differences between persons, which itself is everywhere subject to the inexorable law of apportionment.

VI:1. Do Different Age Groups Learn Different Things?

All societies have recognized that children of different ages are capable of learning different things, although they may differ in opinion with respect to the specific age at which children are capable of learning some one thing. For example, though *shtetl* children (Zborowski and Herzog 1952: 89) start to learn to read and write at the age of three, Americans think this is premature and "pushing" the child. On the other hand, in early eighteenth-century America, "Boys entered Boston Latin School as young as six and a half. They often began Latin much younger," and three-year-olds were taught to read Latin as well as English (Calhoun [1945] I:110). Williams says of China that during the Middle Kingdom boys seven years old were taught to count and name the cardinal points.

> At eight, they must be taught to wait for their superiors, and prefer others to themselves. At ten, the boys must be sent abroad to private tutors, and there remain day and night, studying writing and arithmetic, wearing plain apparel, learning to demean themselves in a manner becoming their age, and acting with sincerity and purpose. At thirteen, they must attend to music and poetry; at fifteen they must practise archery and charioteering. At the age of twenty, they are in due form to be admitted to the rank of manhood, and learn additional rules of propriety, be faithful in the performance of filial and fraternal duties, and though they possess extensive knowledge, must not offer to teach others . . . [Williams (1849) 1:423–24].

On the whole, anthropological monographs have not dealt in detail with the ages at which children learn particular things. Among the few authors who do discuss age differences at some length are Raum (1940) and Ammar (1954). Ammar has provided a thorough timetable for Egyptian children, and though it deals with the tasks they perform rather than the tasks they learn, it may be safely assumed, I think, that the time-gap between doing and learning is not great. Since he has worked it out so carefully, and since anthropology is in need of similar tables, it may be worthwhile to present here (Table 1) his table for children from ages three to seven (Ammar 1954: 30–31).

There is, of course, a great difference between a record of what children are doing and a record of what they are learning, for the record of learning involves a study of precisely how the adult makes known his wishes and transfers his knowledge to the child, and/or how the child learns what the adult wishes are and absorbs the necessary knowledge. Hence Table 1 is merely a good start.

To return to education in early eighteenth-century Boston, it would seem that such education has to be understood as one phase of a total emphasis on early growing up. That was a culture in which boys "became men at sixteen, paid taxes and served in the militia" (Calhoun [1945] I:110). With respect to the *shtetl*, the emphasis on early reading and writing of Hebrew can be understood in terms of cultural survival depending on reverence for, if not knowledge of, the Hebrew classics. In general, the age at which education in a given skill begins may be seen as a function of the total organization of the culture, including ideas about children.

At this point one may generalize and say that what children are taught at a particular time in their lives is determined by the following factors: (1) what there is to learn; (2) the objective physical and intellectual maturity of the child, as well as the members of the culture are able to perceive it; (3) the attitude toward children —which, of course, may seriously modify the cultural perception of (2); and (4) the major goals of the culture —which may be "prestige through head-hunting," "accumulation of capital," "maintenance of *shtetl* culture against the gentiles," "social mobility," and so on.

VI:2. Do the Sexes Learn Different Things?

While published materials lack specificity with respect to differences in education according to age, they

TABLE 1

BOYS	GIRLS
No serious tasks are expected till the age of five, whereupon they are required to work as messengers fetching goods from the shop, or running errands for their parents, uncles, etc. . . . fetching and taking things from and to other homes. Children (between five and seven) are considered to be the best messengers, especially for invitations or for asking help from neighbors, and borrowing from them, being less embarrassed, less inquisitive, and only repeating faithfully what is told to them. In the absence of older sisters he takes care of his younger brother or sister. Towards the end of this period he goes to the field with his older siblings, or with his father, riding behind him on donkey back or balanced in one of the camel's panniers. Helps in carrying grass to the animals, scaring birds from the field, filling waterpots from the canal; ties or unties the cow, donkey, and camel for his father or older brother. On the whole for him this is a stage of observation without allotted specific responsibilities. As the villagers put it, this is the period for children "to be moistened with earth."	Care of infants is one of the girl's main tasks at all ages, and starts as early as five, when she takes her younger sibling outside for play, or attends to him while mother is doing some domestic task. Runs errands like boys, especially for her mother or aunt, e.g., fetching fire, bringing food or other things that need to be hidden with the dangling parts of her head cloth. Accompanies mother to the well or to the Nile with her small pot or tin, carried on her head and supported by her lifted arms. Helps mother in bringing fuel to the oven or the fire, consisting of millet stems, tree branches, dry animal dung, etc. Makes her own loaf with the last bit of dough which she eats after it is baked. This is a means of her initiation to domestic tasks by being "moistened with dough," and a reminder that "kneading and baking" are one of the most important jobs for a girl.

are rich in reports of differences in education according to sex. A few examples will suffice. The first is from contemporary Egypt (Ammar 1954: 207–208):

All the Kuttabs, except the aided one, are confined to boys. Only recently have some girls begun to attend the aided Kuttab. . . . In fact, throughout the history of Moslem Egypt the keenness on teaching girls the Koran has never been so strong as in the case of boys. MacDonald mentioned, however, that there are records of learned women who had finished a Kuttab course and proceeded to a higher educational course in either al-Azhar or the College Mosques (Madrasah); but their numbers were very small in comparison.

Of England in the eighteenth century Bayne-Powell says (1939: 106, 23):

The majority of the girls of the upper classes did not go to school at all. Parents considered it a waste of money to pay for an expensive education, when a governess or waiting gentlewoman could teach them at home for £20 a year all they needed to learn. It was thought, too, as Swift complained, that a "humour of reading books, excepting those of devotion or housewifery, is apt to turn a woman's brain. . . . that all affectation of knowledge, beyond what is merely domestic, renders them vain, conceited, and pretending," and that "a girl will have all the impertinence of a pedant without the knowledge."

[Girls] were carefully taught how to enter and leave a room, how to get into a carriage, how to hand a cup of tea.

The curtsy was an elaborate affair of many gradations, scarcely perceptible in some cases, and in others a fine reverence to the very ground. It was constantly performed, even children curtsied ceremoniously to each other when they met.

In eighteenth-century Germany, it was "particularly difficult for women [of the aristocracy] to cultivate their minds" (Bruford 1935: 65) because of the danger of putting ignorant men to shame. (See VI:3.)

The Dutch both in New Netherlands and in Europe seem to have constituted in the literate world a marked exception to the rule that women should not have an education that made demands on the intellect or trespassed on the prerogatives of men:

The women of the Dutch Netherlands in the sixteenth and seventeenth centuries were more highly educated, better protected by the laws, and more prominent in station than any of their contemporaries. On the woman's judgment, prudence, foresight, everything hinged [Calhoun (1945) I:48].

Calhoun says that foreigners disapproved of the Dutch woman's "ascendancy," and adds, "In New Netherlands both sexes received education and that men and women were more equal than later under English fashion" ([1945] I:167). With the exception of the Dutch settlements, early education in the United States followed closely the widespread European pattern of confining female education to domestic tasks, writing, and "social skills." In conversation with me, Dietrich Gerhardt has suggested that the attention given to the education of upper-class Dutch women may have been related to the important role they played in commerce, even including holding partnerships in mercantile establishments.

VI:3. Are Different Groups Taught Different Things?

The problem of class differences in education in the United States is well known from the work of Hollingshead (1949) and of Warner, Havighurst, and Loeb (1944). These authors describe the ways in which lower-class children in small cities are excluded from educational opportunities that would put them on the "social elevator." Fortes, describing education in Tale society, emphasizes that the uniformity in education there is due to absence of social stratification, but also shows that, as soon as any status factor enters the society, it is taken account of by the educational process (1938: 9–10). In Samoa the *taupo*, or village princess, receives an education quite different from that of other girls (Mead [1939] Part 1:78–79).

Since in Western civilization variously privileged types of instruction were unequally apportioned according to economic level and social class, it would be well to give consideration to some data on the subject. In

eighteenth-century Germany (Bruford 1935: 67, 68, 71), the nobility were ignorant, and the cultivated bourgeoisie were the intellectual leaders. "Almost all [the aristocracy] considered it beneath the dignity of a nobleman to desire any genuine scholarship." In the second half of the same century, however, the nobility began "to follow in the footsteps of the bourgeoisie," although it was still important for their sons to learn dancing, fencing, and riding, along with modern languages. The curricula in the boarding schools for sons of the nobility, therefore, were a mixture of the social arts, including cards, chess, and music, along with subjects like arithmetic, history and geography, and "perhaps some snippets of natural science, the 'curiosities' of botany, anatomy, physics and chemistry." A little ethics and law were also included, along with meat carving! Bruford ends his discussion by stating that, "The proper study of mankind was how to please the great."

It is clear that regularly in Western civilization some class has looked with contempt on enlightenment: knowledge in all areas has had to fight to come into existence and to survive. The history of education in England (Bayne-Powell 1939: 11) and Germany (Bruford 1935) shows, also, that enlightenment by no means always flowed from the higher to the lower classes. It would appear that as the feudal system in Europe began to disintegrate, the bourgeoisie played an important role in forcing new knowledge upon a reluctant nobility and church (Pirenne 1937: 123–24). In the history of Western civilization new knowledge was a threat to traditional status relationships, whether between classes or between sexes, and fear of this threat remains. For this reason a prime effort in Western civilization has been to tame new knowledge and direct it in such a way that it would strengthen the traditional social structure rather than unhinge it.

From the preceding there emerges the interesting fact that the absorption of new knowledge implies a change in the existing social structure. From this generality we may now proceed to some interesting refinements.

Let any increment in knowledge be represented by k. Then, in an infinite universe, the sum of all possible k is $K = \infty$. If we assume no limit to what mankind can learn, it follows that social structures will go through an infinite number of changes, if, in the course of an infinite history, mankind absorbs all possible knowledge. Of course, man, as Spinoza has taught us, is finite, so he cannot know everything, and hence not all possible social structures will be experienced. It is also unlikely that mankind will be around forever! But, if we assume that a great deal of knowledge will yet be absorbed by cultures, it follows that we have very many social structures ahead of us.

Now k is not a simple quantitative function; it has also a quality, which derives from its consequences for social structure. Some k's are low in social-structure-relevance, others high. For example, it is of little social-structure-relevance if somebody discovers a new color for a lipstick, but if someone discovers a new basis for understanding human behavior (e.g., Freud), this has great social-structure-relevance. It is clear therefore, that we must always multiply k (increment in knowledge) by some variable factor α[6] (which stands for "social-structure-relevance"), and that a (adaptation) is a function of the number of k multiplied by their corresponding α. Where $\alpha > 0$, we get $a = f(\alpha k)$. This is a *general sociological law of knowledge and social change*. It states that social change is a function of new knowledge and the social-structure-relevance of that knowledge. (We know, of course, that social structure changes for reasons other than merely new knowledge. The model expresses only the relation of change to knowledge.)

Now, we know that different status groups in a society may exclude each other from knowledge to which each group considers it has proprietary rights. Traditional India is an excellent example of a society structured in this way. In an open system, however, anyone may, theoretically, know anything there is to know.

If a closed system is inundated with knowledge (i.e., k increases greatly), it will eventually fall apart, for the magnitude of the required adaptation (a) will destroy the old system. On the other hand, an open-class system inundated with knowledge allows scholarship and economic exploit to create new status groups to manipulate the new knowledge. Expressing these statements as hypotheses, we may say that (1) knowledge circulates among social-status groups more readily in open social-status systems than in closed social-status systems, and (2) new intellectual horizons are revealed more readily in open social-status systems than in closed social-status systems. The evolutionary, as well as the thermodynamic, implications of these hypotheses are obvious, viz., "Nature hates closed status systems" because they are "counter-evolutionary" in that biologic systems must absorb energy from outside the system (Von Bertalanffy 1950).

VII. DISCONTINUITIES IN THE EDUCATIONAL PROCESS

Benedict (1938) applied the concept "discontinuity" to that type of cultural experience in which there is a sharp break between child and adult roles. In *Coming of Age in Samoa*, Mead (1928) had discussed the problem of abrupt differences between child and adult education. Both writers urged that discontinuities create conflict and tension.

In most cultures, knowledge appropriate to one sex appears to vary primarily with age (i.e., time), and hence, all things being equal, the more that people of the same sex approximate each other in age, the more equal their knowledge. There are cultures, however, where all things are not equal, but where a specific *exclusion factor* creates a massive difference between two persons of almost equal age. Such a factor might be, for example, the withholding of certain kinds of information from a boy who has not yet passed through an initiation ceremony. In such a case there might be a crucial difference in knowledge (i.e., a discontinuity) between two boys separated by a relatively small age difference. Thus once an exclusion factor is introduced

[6] Alpha will vary with every bit of knowledge, for each bit has different social-structure-relevance. For example, alpha will have one *value* for a new lipstick color and a different one for a new theory of interpersonal relations. Thus the value of alpha is always purely empirical.

into the educational process, the learning curve can take almost any course, and a discontinuity can arise even between persons adjacent in age.

The theoretical issue in discontinuity in education does not pivot on *any* items of knowledge, but on *critical* items. In the United States it is of little significance that at twelve years of age Mary does not know the history of the Balkan Wars though her mother does. But it is of critical significance that Mary does not understand menstruation though her mother does. The issue in the study of discontinuities in education, then, is to discover whether there are critical areas of knowledge from which children are deliberately excluded by adults.

Meanwhile it is necessary to take account of the fact that the exclusion factor is often inefficient in operation, so that critical items do get to the child either in whole or in part, or in a distorted form. Though Benedict says that adults in our culture *view* the child as "sexless," the *child* is not sexless; and he manages to find out a great deal about sex, and engage in sexual experimentation, in spite of adults. This leads to the interesting conclusion that knowledge drags role-performance after it. In less vivid language, a person possessing knowledge will tend to put it to use even in the face of social sanctions against such behavior. This might be called "the law of the forbidden fruit," i.e., forbidden knowledge will be put to use when the resultant rewards exceed the punishments, or when the culprit feels he can evade the consequences of breaking the law.

When the exclusion factor affects whole groups of adults, we get differentiation in the social structure. It would appear, therefore, that the exclusion factor has social-structure-relevance. We infer from this that the persistence of exclusion must have as its function the prevention of social change. Armed with this inference, we may return now to the world of the child, to inquire whether the exclusion of children from certain areas of knowledge is not for the purpose of preventing social change. It seems likely, for example, that keeping knowledge of sexuality from children in American culture has served to maintain the old authoritarian family structure in which the children remained unmarried until they fought their way to independence. Among the Chagga, ignorance on the part of young women that men really do defecate is related to male prestige. Among the Hopi, keeping children in ignorance of the fact that the *kachina* dancers are men, not gods, helps maintain the moral sanction system.

When a child is excluded from knowing *all* about something of which he knows part, he tends to imagine the rest, provided he is interested. Since adults tend to fill the gap in the child's knowledge with stories, in lieu of the truth, it often becomes difficult to tell what the child has spontaneously imagined, and what he has been told in stories by adults. There is this danger inherent in educational systems containing discontinuities, that they foster distorting fantasies in children, and oblige adults to lie or to maintain a silence that perplexes the child and breeds distrust. The Manus, in the Admiralty Islands, seem to constitute an exception to this, for, Mead tells us (1939: Pt. 2), the children contemptuously thrust the adult world from them.

Today the nursery tales that formerly were told to children to explain the world they did not know have given way to television programs which pour *their* tales into the minds of children. That is to say, young children, knowing little about what adult jobs really are, fill their fantasy world with mass-produced distortions. The following examples from interviews with nursery-school children illustrate the point. The interviews were carried out by Mrs. William Gomberg.

FRANKIE: He wants to be like the Lone Ranger[7] when he grows up, or like any cowboy. Cowboys are all good and their only occupation is to kill bad guys, ride horseback "real good" and fire a gun very well.

ROBSON: I don't like the Indians, they are naughty, they go where they are not supposed to. . . . I like the Lone Ranger, he shoots some cowboys; some cowboys aren't good. [Why?] Cause they were bad; they were riding and they were dead, and then they were bleeding, and that means you are dead, and when you're dead that means you are bad and you then fall down. Death is bad; you bleed and bleeding is bad. . . . He would like to be big like Lone Ranger and shoot the bad people . . .

NETTI: Superman[7] didn't come, he was far away in Brazil where I was a baby. He's real. . . . He and Mighty Mouse,[7] they're real, Oh yes; he's not make-believe, I know. I got a picture of him and he loves me and he kisses me and he gives me things, like a sewing machine and beer and candy and toys. Oh yes, he came to my house and brought it to me, I saw him. No, not on TV. I see him on TV, but this was different; he came to my house and kissed me.

ROGER: I see Lone Ranger on TV sometimes. I like him and cowboys but they shoot people and then people have to go to the hospital. They are always mad at people cause they always shoot and they don't like each other and that's why they shoot. People shoot but they shouldn't do that, it's wrong to shoot one another. I don't like to watch anything else. I ask my mother all the time, why do they have to shoot one another and she tells me they get very mad. I don't know if they are good people or bad people. They must be bad people if they have to shoot one another, don't you think so? My mother thinks so too.

MICHAEL: [He says of the program "Calling all cars":] That's the police car calling. That means to come out and fight the bad guys. Police are good guys and they have to fight the bad people. [He seemed disgusted at my lack of knowledge, and threw his hands out, saying, "Don't you know nothing?"]

While in cultures characterized by unity of the social sphere (Fortes 1938) the play aspects of socialization tend to relate directly to the realities of future adult roles, in American society they become deeply enmeshed in mass-produced fantasies. The above interviews are responses by children who act out in their play the characters they mention in their interviews.Thus there enters into the children's play, not the make-believe or practice dimensions of a genuine adult world, but com-

[7] The Lone Ranger, Superman, and Mighty Mouse are characters in television shows. The Lone Ranger appears in cowboy pictures. He wears a mask, rides a wonderful horse called "Silver," is accompanied by a faithful Indian companion, and always does good, defeating the "bad guys," the evil men. Superman can fly through the air, hold mountains in the palm of his hand, and withstand most lethal weapons. In everyday life he is a newspaper reporter, Clark Kent, but when he dons his magic clothing he becomes Superman. Mighty Mouse is a Superman-like mouse.

mercial distortions of the world based on *adult* fantasies. The point is that the children's play becomes saturated with their *own* fantasy versions of adult fantasies, thus "compounding a felony." The groundwork for this is laid by the discontinuity in education.

Since discontinuity, true exclusion of children from adult knowledge, creates conflict and distortion, one might think that the phenomenon is rare. Yet, it is rather common the world over. Possibly one of the most "popular" discontinuities in primitive education occurs in the realm of ceremonial, religion and magic, and such discontinuity is often broken at initiation. As we have noted above (I:28), it would appear that the function of this discontinuity and the abrupt breaking of it is to effect reorganization and reorientation of the personality. The following is an illustration from the life of one Hopi:

> I had a great surprise. They were not spirits, but human beings. I had recognized nearly every one of them and felt very unhappy because I had been told all my life that the Kachinas were gods. I was especially shocked and angry when I saw my uncles, fathers, and own clan brothers dancing as kachinas . . . [but] my fathers and uncles showed me ancestral masks and explained that long ago the kachinas had come regularly to Oraibi and danced in the plaza. They explained that since the people had become so wicked . . . the kachinas had stopped coming and sent their spirits to enter the masks on dance days . . . I thought of the flogging and the initiation as a turning point in my life, and I felt ready at last to listen to my elders and live right [Simmons 1942: 84–87].

We have one similar example from the Chagga:

> Before circumcision I was very much annoyed at being called *iseka* by those already circumcised and even by women. I was told that I would not be able to bear the pain, and that if I frowned or moved even my big toe even a little I would be beaten. A song would be composed about my cowardice, and my chances of being married spoiled. For these reasons I was very much afraid lest I should fail to stand the excruciating pains that make you a man. I had half a mind to shirk circumcision, but realized it was better to be mutilated than to be ridiculed and despised. At the time of the circumcision itself I was neither elated nor disappointed. My body felt as if benumbed, but presently I felt a pain the like of which I had not suffered before. At once a great joy welled up in me at having passed the test of pain without disgracing myself. This joy was increased by the congratulations of my relatives and their words of comfort and admiration. After my recovery I felt proud to be a man whom nobody dared to call "hobbledehoy" [Raum 1940: 310].

The phenomena of reorientation and reorganization accompanying the rupture of a discontinuity lead to the necessity for evaluating discontinuity in other than purely conflict terms. In view of the Hopi and Chagga evidence, it appears necessary to consider the possibility of a new dynamism's entering life through the burdens placed upon the personality by the need to overcome the shock of new knowledge.

VIII. WHAT LIMITS THE QUANTITY AND QUALITY OF INFORMATION A CHILD RECEIVES FROM A TEACHER?

This section is not concerned with the question, "What makes men blind?"—which alone would require a book to answer. Rather, it is confined to the question, "When a teacher has before him a child to whom he must communicate a definite body of information, what limits the quantity and quality of the information the child receives from him?"

Before taking up in detail the ten categories in this section, it might be interesting to ask, "Are there differences between American and non-literate cultures with respect to any of those categories?" For example, is it possible to say that the methods used to teach a skill in some non-literate culture, whether hunting, fishing, agriculture, dancing, or ceremonial, limit the proficiency with which that knowledge or skill is mastered (VIII:1)? If there are differences among Tikopia men in fishing skill, are these differences due to the way the various men were taught, or to differences in the men themselves? Firth (1936) raises this question, but, on the whole, information on the subject is lacking from non-literate cultures. Information is lacking also for the categories:

VIII: 7. Failure of teacher to correct pupil's mistakes
8. Failure of teacher to indicate whether the pupil's answers are right or wrong
9. Failure of teacher to respond to a question
10. General vagueness or fumbling of the teacher

None of the following considerations seems to affect the educational process in non-literate cultures:

VIII: 2. Available time
3. Quality of equipment
4. Distance from the object
5. Ignorance or error of teacher

That is, there seems to be no time pressure; equipment seems to be adequate; the object of instruction—the land, the bow, the fish-net—is always available; the teachers seem always to know their subject matter. On the other hand, there seems to be a great deal of hostile stereotyping (VIII:6): members of other villages may be witches or "constipated," as among the Pilagá; or, more commonly, members of other tribes are considered non-human, and their customs absurd.

In American culture, by contrast, a pupil is limited in what he may learn from his teacher by the fact that the teacher often rushes through the lessons, lacks adequate equipment, teaches about things that are often remote from him and from the pupil either in space or time or both, and teaches subjects in which he himself is weak in knowledge. When we realize that categories VIII:7–9 set still further limits on what children in American culture may learn, it becomes abundantly clear that it is more difficult for a child to learn in this culture than in non-literate cultures.

The complexity of classroom experience in contemporary American culture is such that the quotations which follow will reveal several limiting factors to be operating at the same time. The first examples are taken from a sixth-grade elementary-school class. The students are having an arithmetic lesson. The recorder was Amanda Chura.

TEACHER: Monitors, are you ready yet? They shake their heads, no. Two children go to the teacher's desk to talk to her.

TEACHER: Alright, girls, you have no time to waste. Now *I'm* waiting. Hurry!

Some of the children have been working problems on the board. Gloria drops her ruler, looks at AC, puts hand to mouth, looks guilty. . . .

1:16 P.M.

TEACHER: Alright, monitors, collect the noonday problems. Alright, first class ready. Alright, let's take out our graphs that we worked on this morning. Alright, hurry up. You take too long on these problems. It should only take you about five minutes.

TEACHER: Now let's take out the graphs that you drew. Now when we looked at our graphs before—what other words do you know that end in g-r-a-p-h? David?

DAVID: Telegraph.

TEACHER: Ray?

RAY: Phonograph.

TEACHER: Richard?

RICHARD: Paragraph.

TEACHER: Yes; and what about photograph? A photograph is a picture; it carries a message to our eyes. A telegraph carries a message.

The teacher's asking for words ending in -graph was accompanied by eager waving of hands by the children.

TEACHER: Who would get a lot of use out of these graphs, Larry?

LARRY: The business bureaus.

TEACHER: That's right. The businessman could just look at a graph and he could read something from it.

The first thing to be noted here is the emphasis on shortage of time, and that it is not to be wasted. American children work almost constantly under the lash of time. The second point of interest is the teacher's ignorance. Words ending in "-graph" are given her by the students, and she suggests that the morpheme indicates "message." It is possible that the significance of the similarity among "graph," "photograph," and "telegraph" may have been grasped by the students along with the (erroneous!) idea that they all "mean" message. Where in his picture, however, would the wondering child fit "phonograph," and, especially, "paragraph"? The teacher avoids the problem by not responding to the waving hands of the children. Third, note her lack of concreteness about businessmen's use of graphs.

The lesson now turns to review of the problems of perimeters.

TEACHER: We'll do a little reviewing of measuring by feet, inches and yards. That measure is called linear—it is along a line. What could you measure by feet and inches? Roy?

ROY: A swimming pool.

TEACHER: A swimming pool? No, I don't think so . . .

TEACHER: I want you to make up six problems and work them: two with perimeter, two with square measure, and two with cubic measure. Right now we will make up a few examples.

1:45

David raises his hand practically right away.

TEACHER: David?

David starts.

TEACHER: Wait a minute, I can't hear you. You talk too low anyway. Now stand up nice and straight.

DAVID: A farmer had a field 30 by 40 feet. He bought another of the same size. What are the dimensions of both together?

TEACHER: Now you don't mean dimensions, do you? You already gave us that.

DAVID: I mean perimeter.

TEACHER: Alright, now repeat the problem.

David repeats.

TEACHER: *You'll* have to tell if it's the right answer or not, I'm not in on this one.

(AC notes: The way she said it made it appear to me that she didn't understand the problem or else couldn't figure it out.)

David calls on Arthur and Arthur answers 280.

TEACHER: Yes. Now let's have another one; don't make it too hard. Make it so we can all work it in our heads. Now make up a problem for square measure. Make it easy enough. Save the hard ones for your written problems.

Obviously there are three possible solutions to David's problem, depending on whether the fields are separate, contiguous on their long sides, or contiguous on their short sides, and the teacher was not able to solve it.

This was followed by another "hard" problem, and the teacher said, "Alright, we won't give the answer, but we'll tell how to work it right now." The teacher then became irritated and issued a flurry of commands. At 2:00 P.M. the observer recorded: "Teacher still sits there staring at them with that mean look." The sudden burst of irritation suggests that she was upset by the problems.

At this point it is useful to remark on some limiting factors that are not listed in the outline but are apparent in the above examples. It has been noted that the teacher introduced into the discussion of graphing a consideration of the meaning of the morpheme "graph." In so doing, she distracted the children from the immediate subject matter. We might call this an instance of irrelevant introduction of polyphasic learning (Henry 1955*a*). It might not have been so bad if the teacher had given an adequate explanation of the meaning of the morpheme, but, instead, she merely generated confusion about it. Thus, the irrelevance interfered with learning in two ways: it interrupted the learning of graphs, and was itself erroneous.

The teacher's command to David to stand up straight while he was reciting belongs in this same general category of irrelevant introduction of polyphasic learning. Of what importance to arithmetic is it that David stand up straight while he presents his problem?

A second limiting factor is listed in the outline as V:5, insecurity of teacher. In the above example, the teacher's insecurity further muddied the waters of knowledge.

We turn now to a classroom in which, according to the system used in some American cities, bright students are taught together with slow students who are a year ahead of the bright ones in grade. The lesson is on geography, the recorder is Ella Brown, the teacher is a man, and the students are a combination of the grades sixth-high and seventh-low. As in the example above, the children are very eager.

TEACHER: Look at page 206. Where would you find Portugal?

Several children give the boundaries of Portugal and the countries that lie nearest it. All the children were talking at once.

TEACHER: Now find Switzerland. Where is Switzerland, Essie?

ESSIE: Kind of north of Italy.

TEACHER: Alright. Now where is Denmark?

A girl says, Sticking out into the North Sea.

TEACHER: Genevieve Wells, What is Denmark that Switzerland and Portugal are not?

GENEVIEVE: A seapŏrt.
TEACHER: Oh, no! (Disappointedly) Lisbon is one of the largest seaports in the world.

Children answer, It's a peninsula.

TEACHER: That's right. What is a peninsula? He calls on several children who do not give the right answer. Then he calls on Bob, Susan, Phillip. Melvin's hand is waving among others. Teacher calls on him.
MELVIN: A peninsula is a piece of land surrounded on three sides by water.
TEACHER (*very enthusiastically*): Yes, that's right; a peninsula! A peninsula is a piece of land surrounded on three sides by water. What do these three countries [Portugal, Switzerland, Denmark] have in common?

Linda and Melvin have their hands up.

TEACHER: Linda.
LINDA: They're small.
TEACHER: Yes, they're all small. Now look at the picture on page 215. What are the women doing? The children look at the picture and a girl answers that they are drawing water.
TEACHER: Yes. In many of these countries there is no plumbing. Why do you think they have no plumbing? Several hands are up. Teacher calls on Essie.
ESSIE: It's too expensive.
TEACHER: Yes, it's too expensive.

Linda's hand is up. Teacher calls on her by name.

LINDA: It's a backward country.
TEACHER: Yes, it's a backward country.

The picture shows a number of women with earthenware vessels drawing water from a well that seems to be in a central place.

Let us discuss in order the points raised by this lesson. (1) The teacher, by failing to adequately correct Genevieve (VIII:7), permits her and the rest of the students to remain confused about the difference between a port and a country. (2) Considering the distance of these children from Europe (VIII:4) and their general provincialness, it is important to correct such a misconception, even though it might seem on the surface that the misconception is merely inadvertent. (3) Generation upon generation of American children have been enthusiastically taught by teachers that a peninsula is a body of land surrounded on three sides by water. One wonders: (*a*) what is the reason for the enthusiasm over *this* relatively unimportant fact, and (*b*) of what importance is it to know what a peninsula is? Emphasis on one relatively insignificant item such as this tends to make it stand out, and exercises a limiting effect on the learning of more important data. This plays a role in narrowing the perceptual field. (4) Since Portugal, Denmark, and Switzerland are grouped together as small, the child's conception of them becomes stereotypic (VIII:6), thus obscuring the great differences among them. This kind of teaching lays the groundwork for a stereotyped world divided into large (important, significant, prestigeful) countries, and small (insignificant) ones. (5) Portugal, Switzerland, and Denmark are grouped together as backward and lacking plumbing. Here we deal not only with stereotyping but also with ignorance on the part of the teacher (VIII:5). All these elements of a learning situation have profound influence on the child's conception of the rest of the world, even to influencing his later voting behavior and his attitude toward war and peace. Further, we must remember that this teacher probably thinks and believes as he is teaching the children to think and believe, and that *he* votes and has ideas on the "international situation" too!

These teaching failures, considered together, are related to the following features of American culture: (1) the vast size of the available body of knowledge; (2) the absence of the teacher's role-performance of the specific knowledge he is required to impart; (3) the low status of teachers; (4) the remoteness of the consequences of teaching failure; (5) the orientation of the total system; (6) the obsolescence of knowledge.

(1) In societies inundated with knowledge, like contemporary industrial societies, we encounter such enormous differences in knowledge among individuals that many may be unaware of even the existence of whole bodies of knowledge. This is absolutely different from non-literate cultures, where, although some people may not know some of the things there are to know, everyone knows what knowledge exists. As knowledge increases in any *culture*, ignorance tends to increase in *individuals*, for these come to know less and less of the total available information. The quip that, "A college professor is a person who knows less and less about more and more," applies to everyone in contemporary culture, and especially to schoolteachers since they are expected to teach many subjects.

(2) In section VII, on discontinuities, it was stated that knowledge drags role-performance after it. It would follow that, in the *absence* of role-performance, there is no knowledge: a man who has never taught would, ordinarily, not know how to teach (although he might know something about teaching). This same reasoning applies to teachers who have no role-involvement in the *subject matters* they teach. That is, they cannot be said to really have knowledge of those subject matters. For example, anthropologists would not ordinarily tend to make mistakes about the geography of areas on which they specialize, for their role-performance enforces knowledge of those areas; but elementary-school teachers who have never been to Europe, or worked in a travel agency or an importing or exporting company, might have but the haziest notions of the geography of Europe. A draftsman or a surveyor would be expected to be able to calculate a periphery rapidly and correctly, for his role-performance requires this. But a teacher is role-involved only in teaching; he knows about peripheries only at second hand, and therefore is not unlikely to make mistakes in calculating them. In stark contrast with contemporary industrial societies, teachers in all non-literate cultures are role-involved in what they teach: archery is taught to the children by accomplished hunters, agriculture by husbandmen, religion by men and women who practise what they preach (whether it be good or evil!), and so on.

(3) Since most elementary-school teachers teach the same limited number of subjects year in and year out, one might conjecture that they ought to know those subjects very well. But this cannot be expected unless they are given satisfying incentives in money or prestige. Since they are given neither incentive in American culture, teachers tend to stay at the lowest level of performance that is acceptable to their administrations.

(4) In non-literate cultures, the consequences of an adult's failure to properly teach culturally requisite skills would be immediately felt. For example, the boy

who was inadequately taught to hunt would be an unsuccessful hunter, with the result that both he and his kin-group teacher would suffer hunger. In contemporary American culture, the involvement of the teacher with his students is more remote. There are probably teachers who do experience student failure in terms of concern about the student's life-chances, but, for the most part, American culture does not encourage such concern, and it certainly does not make the teacher suffer so directly for want of it. A teacher's standing may depend in some degree on his pupils' achievements, but this does not imply personal involvement in his students' *welfare*, and the lack of deep involvement permits him to remain at a minimal level of efficiency. Firth's remarks on education in Tikopia (1936: 148) underscore the relationship between personal involvement and expertness in teaching, and also bring out a further fact, the importance to the teacher of his student's gratitude:

> The training of a boy . . . is often due to the interest of one of his mother's brothers in him. If this man is an expert in any branch of knowledge he will probably see to it that his nephew receives some of the results of his experience. If he is a noted canoe-voyager and fisherman he will pass on his store of information in the finer points of his craft to the lad: especially will he show him the location of fishing-banks, a prized set of data not possessed by all fishermen. In dirges composed to the memory of mother's brothers reference is not infrequently made to this sort of assistance. A grandfather may take a great interest in a child's upbringing and may provide him with traditional lore, names of family ancestors and their history, tales of ancient fights and immigrations. . . . The transmission of details of family ritual and more esoteric information concerning the family religious life is essentially the role of the father, and not infrequently does the head of the house lament the fact of his own comparative ignorance due to his father's early death.

(5) The orientation of the total educational system is an important factor at the root of teaching failure. For example, in the United States there is a sharp division between those who think that the primary function of a teacher is to facilitate a child's emotional adjustment, and those who think that the teacher's main function is to teach subject matter. In non-literate societies, education does not face this problem. While it is obvious that this and similar dilemmas arise because man is groping toward a new adaptation, it is also clear that they are related to the complicated role-involvement of the American teacher. That is, constantly teaching subject matters of which his knowledge is imperfect, he reaches, in his anguish, toward a subject matter in which he can imagine himself to have some broad competence. Alas, it is only too clear that he does not even have expertize in "adjustment" (Henry 1955*b*, 1957*b*)!

(6) The dictionary definition of *obsolete* is "gone out of use." In this sense, almost no knowledge becomes obsolete in a literate culture with an interest in history: knowledge of alchemy and of the building of pyramids and battering rams still has a use in the history of science. Whether for historical or other reasons, it is difficult to dis-use knowledge in a culture with written records. Nevertheless, there is a sense in which knowledge does go out of use even in a literate culture: it becomes obsolescent if there is no role attached to it.

Since the next examples I give are derived from elementary-school classes in ancient history, I shall discuss the obsolescence of knowledge, and its relation to social role, in the context of ancient and nearly forgotten things. Nowadays, there are still people who know the ancient art of throwing the discus and can teach it, but, since we no longer hold the polytheistic beliefs of the ancient world from which the art comes, there are no priestesses of Athena among us, and the knowledge of how to be a priestess to Athena is dead. What little remains of the knowledge associated with the roles of priestess and oracle is well known only to ancient historians, i.e., to persons who specialize in knowledge of archaic roles and the associated knowledge. Parenthetically, the fact that little of the technical knowledge that went along with these roles is available today testifies to the validity of the generalization that knowledge and role are indissolubly linked.

Let us now picture the sixth-grade teacher who is supposed to teach the history of ancient Greece. She suffers from all the five disabilities listed above, she has never been to Europe, and, above and beyond these, she is obliged to teach about a civilization most of the roles of which have disappeared. Let us look at excerpts from the record of the performance of such a teacher and her pupils. The observations were made by Amanda Chura:

TEACHER: We've been reading about this parade in Greece to honor Athena. Why did they honor her?

Pat says she gave wisdom.

TEACHER: What else?

Norma thinks she symbolized something.

TEACHER: The Greeks had beliefs. What do we call them today?

CHILD: Myths.

TEACHER: And these are read by children today. What Greek building have we read about? I should say temple. Someone says, Parthenon.

The teacher now talks about carved stone with animals or figures and these are raised.

TEACHER: What do we call this?

CHILD: Bal-relief.

TEACHER: It looks like bas- but it's really bal-.

TEACHER: The Oracle of Delphi represented Apollo. There was a woman there to answer questions, but Apollo was not a woman. Today people go to places where they make you believe that the dead speak. I don't know how real this oracle was.

TEACHER: Let's look at the map. It is in the book. I see a lot of people haven't even bothered to turn the page. Come on now.

Teacher names Olympia and other places.

TEACHER: Start reading Sharon.

Darius is not paying a bit of attention, but is looking to the back of the room. Antoinette is talking to her neighbor.

Teacher explains what is meant by foreign birth. If a male is not born in Greece but in a foreign country he is not eligible to compete in the Olympic games. . . . Somebody says that the Olympic Festival is like the Muny Opera (i.e., the St. Louis Municipal Summer Opera where musical comedies like *Oklahoma* and *Guys and Dolls* are performed).

TEACHER: Well, yes, but just a little.

TEACHER: What great difference was there between the purposes of Athens and Sparta, Pat?

PAT: Athens was a city of beauty and Sparta a city of war.

TEACHER: I agree with the Athens part but not with Sparta. David?
DAVID: Spartans were trained to be soldiers while Athenians were interested in their city.
TEACHER: Yes, a good answer. (She repeats it.) We can go to college and take subjects just about art and music. Of course we have to take English and Language, but we can major in art. Why have the stories of the battles of Marathon and Thermopylae been told through the ages?
CHILD: Because they fought so bravely.
TEACHER: Yes, because they fought so bravely. In our country we have a similar example in Remember the Alamo. [In 1836 a group of Texans, defending the fortress Alamo against Mexican troops, was destroyed. For many years the cry "Remember the Alamo" was the rallying cry of those Texans who fought against Mexico for independence.]

Since the teacher is dealing with a social system the roles of which have disappeared, she attempts to make the subject matter live by using bad analogies from contemporary roles: the Oracle at Delphi is likened to a vague "place where they make you believe that the dead speak," and the Olympic competition is compared by teacher and a student to a musical-comedy performance. Since all ancient Athenians and Spartans have disappeared, the teacher and students accept the empty cliché that, "Spartans were trained to be soldiers while Athenians were interested in their city." Thus the fact that the knowledge about ancient Greece has become obsolescent, in the sense intended here, leads teacher and students into ignorance. Further revealed in the excerpts is the guided recall (II:7) method of instruction, according to which students are required to remember separate "facts" but receive no integrated picture of ancient Hellenic life and thought. This, too, is a limitation on learning, and, in this connection, it is relevant to note the instances of inattention by students (Darius and Antoinette).

IX. WHAT FORMS OF CONDUCT CONTROL (DISCIPLINE) ARE USED?

In this section I distinguish between order and discipline. "Order" is defined here as a state in which a person is oriented toward social goals, while "discipline," in the sense intended here, refers to methods used to prevent disruptive behavior. An orderly person is essentially a thinking person highly motivated toward social goals; while, in the present context, a disciplined individual is one who is merely controlled in his outward conduct. Discipline *can* work in the service of order, and often does, but not always. For example, a child sitting quietly in his seat in class may detest the work. Thus he is outwardly disciplined but is, in the present definition, disorderly, for he is not oriented toward the social goal, i.e., the lesson. On the other hand, a child oriented toward social goals could not be undisciplined, because disruptive behavior is generally antithetical to social goals.

Order and discipline, or, rather, order versus discipline, is an ancient issue in Western culture. In the winter of 431 B.C., in the course of delivering the panegyric at a public funeral for war casualties, the Athenian Pericles compared the Lacedaemonians with the Athenians as follows:

> In education, again, we leave it to our opponents to cultivate manliness by a laborious training from their tender years upward, while we, with our undisciplined life, are as ready as they to face every reasonable danger. . . . the fact that we preserve a military spirit by a life of ease instead of deliberate hardship and by a natural rather than an artificial courage gives us a double advantage. We are not compelled to anticipate the rigors of war, yet we face them, when they come, as courageously as those who are in perpetual training [Toynbee 1953: 39, quoting Thucydides].

This was the attitude of men who lived by laws "whose moral sanction is so strong that there is no need for them to be written" [Toynbee 1953: 39, quoting Thucydides].

Pericles' speech shows that the issue of order versus discipline was joined more than 2,000 years ago. It is still with us today. Something of this nature must have been in the minds of the Russian educators, P. Yesipov and N. K. Goncharov, when they formulated the following (Counts and Lodge 1947: 94, 96, 97):

> An extremely important component part of moral education is the education of children in conscious discipline. Without discipline and habits of organization one cannot study, one cannot work. But it is not merely a question of ensuring the *discipline* of pupils during the school years. Before the teacher stands a much deeper task: the cultivation in children of a *state of discipline* as a high quality of communist morality and one of the most important traits of character. The development of this quality in children is linked with the task of preparing future citizens of the Soviet state who will act from a sense of public duty and will possess a feeling of responsibility before the socialist Motherland. . . .
>
> A state of discipline cannot bear merely an outer character. The qualities [of discipline] require an inner condition. Conscious discipline cannot rest on a foundation of fear. . . . It is important that our pupils desire and strive to become disciplined, not because of external pressure but because of their own voluntary promptings. It is important that their own active disciplinary powers function and that they have an inner harmony with discipline and a desire to achieve it. Such discipline leads inevitably to self-discipline. . . .
>
> The basic conditions for the cultivation of conscious and firm discipline in pupils are clearly outlined in a recent decree of the People's Commissariat of Education of the RSFSR: "The discipline of pupils is nurtured by the general practice and the whole content of the work of the school: skillful teaching of school subjects, strict regimen for the entire school life, unwavering observation by each pupil of the 'Rules for School Children,' firm organization of the children's collective, and rational use of measures of rewards and punishments. The leading role in this work belongs to the teacher."

In the thinking of Pericles and the Russian educators, it would appear, discipline is an ideal inner state, a moral principle, a trait of character. This is what is meant here by "order."

When we turn now to the more specific problems of education, we discover that the need to exercise conduct controls over the child during instruction in formal skills arises almost exclusively in literate cultures, and it is the difficulties arising in connection with this need that are the concern of the present section.

Since school children of all ages in the United States tend to be unruly, much of a teacher's energy goes into the effort to maintain conduct controls, for an undisci-

plined class cannot learn a subject matter, i.e., it is oriented away from the social goals by its disruptive behavior. Thus an undisciplined class falls naturally into disorder. The ability to maintain discipline in a classroom seems to consist of the following components: (1) the specific techniques available to the teacher for the purpose; (2) the attitudes of the teacher (V); (3) the characteristics of the students (covered in part in section IV); and (4) the teacher's manipulation of the instruction itself (much of this is included in section II, but some is found in section V also). To these we might add (5) the attitude of the culture toward knowledge; and (6) the nature of the cultural ideals. These, however, would affect order largely through the person of the teacher in interaction with the students.

In the extracts from observations of American classrooms we will see that the techniques employed to exert conduct control are rarely used with a moral implication, or with the implication by the teacher that some deeply felt social ideal is being violated. Rather, the reason the student is commanded, threatened, or reprimanded in connection with walking around, talking to his neighbor, or daydreaming, is simply because it interferes with work, or because it offends the teacher. From studying disciplinary mechanisms year after year in American classrooms, one derives the pervasive impression that discipline has become detached from a socially significant moral base.

In the outline, twenty techniques for maintaining discipline have been listed. A finer coding might discriminate further, and separate listing of all the idiosyncratic devices grouped under 19, "Special Strategems," would expand the list even more. The list as it stands, however, is adequate for the present purpose of illustrating techniques used for conduct control in one contemporary industrialized culture, the United States.

Not all American teachers use the same techniques, and even widely-used techniques, like 8 ("command") and 5 ("reprimand"), are employed more frequently by some teachers than by others. Furthermore, teachers using 8 and 5 may use them in qualitatively different ways: some teachers may be sarcastic in their reprimands, and some may be gentler than others in issuing commands. Always it must be borne in mind that the image of a teacher as a disciplinarian is tempered by other things—especially by V ("What Is His Attitude?"). For example, a strict disciplinarian might also joke with his students and permit them to argue or joke with him. Thus, study of IX alone, and study of IX in association with V, IV ("What Is the Attitude of the Student?"), and II ("What Are the Teaching Methods?") suggest a great variety of discipline-maintaining patterns, each peculiar to different types of teachers, and to different types of students: first graders as compared with fourth graders, high-school students as compared with elementary-school students; incipient delinquents as compared with more conforming children, and so on.

Illustration of the categories in this section on discipline requires considerable fragmentation of the data, thus each category that is discussed will be listed according to the number it bears in the outline, and each illustration will be followed by the code letter of the observer and the year of the observation. Protocols have been selected only for the years 1957, 1958, and 1959.

IX:3. Sense of Propriety

The children in this fifth grade class are about to be the audience for another class which is going to show off the Easter bonnets they have made. The teacher says to her children: if we're going to be an audience we have to be very, very polite. Just admire them. [LaB. 4/12/57.]

This observation also embodies IX:10 ("'We' Technique") and IX:15 ("Putting the Child on His Mettle").

TEACHER: Wait a minute, Gertie; someone is very rude behind you—someone very nice too. [D. 4/11/57.]

This observation also embodies IX:11 ("Instilling Guilt") and IX:12 ("Cessation of Activity").

The students are seventh and eighth graders. The teacher had to step out of the room for a moment and it became a bit noisy. When the teacher returned he said: in a calm, soft, conversational tone to the very still class, I am disappointed at some people's manners. I am talking to someone out here in the hall and you people are talking and mumbling and having fun when there is plenty of work to do. [Va. 4/24/59.]

This observation also embodies IX:11 ("Instilling Guilt").

In this first grade class the children are having a reading lesson. The word *sailboat* has come up, some children have failed to identify it in the reader, others are eagerly waving their hands, and some in the front seats are leaning forward and shaking their hands for attention. The teacher, in an annoyed voice, says, How would you like it if I did that to you? [C. 5/11/59.]

This observation also embodies IX:5:4 ("Impersonal Reprimand") and IX:11 ("Instilling Guilt").

It will be noted that, if any morality is at issue in these observations, it is the morality of decorum. Observation Va. 4/24/59 seems to imply that disorder both violates decorum and also interferes with work.

IX:4. Affectivity

The category "Affectivity" has been explored at length by Henry (1959). The essential point is that the teacher attempts to keep the children under control by making himself a love object to them, and awakening in them both a fear of loss of love should they do anything to offend him, and a sense of guilt when they have offended him. One example, taken from a reading lesson in Mrs. Thorndyke's third-grade class (the children are about 8–9 years old), will illustrate this point. The observer is Henry. On this day, the children are asking each other questions about the story, instead of being asked questions by the teacher. There are 25 children in the class, but the group to be described is made up of the dozen or so best readers, who sit facing each other on two rows of chairs in the front of the room. At 10:27 A.M. Mrs. Thorndyke is standing behind one of the rows:

She pats Alfred to restrain him and he shows a slight tendency to withdraw. There is a loud burst of noise. Mrs. Thorndyke's hand is on Alfred and he seems to wish to get out. Now her hand is on Arty, who makes no move. Teacher pats and strokes Matty who also makes no move to withdraw. Now Teacher is standing behind Arty, lightly passing her finger-tips over his neck. She goes back to Arty, puts a hand on Alfred to restrain him. He makes withdrawal signs. Alfred and Arty are now interlocking *their* hands in the air and

Alfred is talking to Arty. 10:32 Teacher stops behind Otto to restrain him. Her hands are on his cheeks; his tongue goes in the direction of his right cheek and pushes it out as he closes his eyes. When Mrs. Thorndyke withdraws her hands, his eyes pop open as if he had suddenly awakened. Mary, who previously was holding onto Mrs. Thorndyke as the teacher stroked the child's arm, has now slumped in her seat. Teacher goes to her, puts her arms around her and pulls her back. Mary takes Teacher's hand. Alfred is talking and Mrs. Thorndyke pats and strokes him. He does not withdraw this time. Alfred is now talking to Arty and Teacher is stroking Alfred. Again he does not withdraw. Now Alfred caresses Otto and Arty caresses Alfred. 10:38 Malcolm asks questions now and all the children say his questions have been asked. Mrs. Thorndyke says, "My only objection to that question is that it can be answered by either yes or no." She strokes Matty. All this time the questions are being asked and there is great excitement among the children. Sherry asks questions and Teacher says, "We've gone over that." She strokes Matty and he does not resist. She touches Mary flutteringly with her finger tips.

Now Mrs. Thorndyke terminates the lesson, and the papers with the questions are collected. Suddenly she becomes very grave and silent. She later told me that Mary had answered a snippity "no" to something Teacher had said. Now Mrs. Thorndyke says, *"My, I'm terribly disappointed."* There is absolute silence, and Mrs. Thorndyke says, "Matty, you're excused to go to your seat." She later told me it was because he's a general all-round talker and wouldn't quiet down. Matty goes to his seat looking very unhappy, his lips compressed. The room is silent now.

Now Group 2, the poorer readers, occupies the seats deserted by Group 1. Teacher seems very tired now, and goes through the lesson mechanically. Her voice is weak and she leans against the blackboard. Time, approximately 10:50.

IX:9. Command Question or Request

"Let's sit down please." This example also illustrates IX:10 ("'We' Technique"), for the teacher uses the first person plural although the command-request is intended for the pupils only.

IX:12. Cessation of Activity

Teacher says, Bill and Joe, would you like to leave the room? She is silent for a long time. [McK. 4/9/57.]

This example also embodies IX:14 ("Threat").

There is an increase in noise and teacher says, Just a moment, Mary. Teacher looks briefly at two boys who are talking, and then back at Mary. Begin again, Mary. [Pe. 3/10/58.]

This example also embodies IX:16 ("Non-verbal Signal"), for a look is a non-verbal signal.

Teacher says, Wait, we can't hear because someone is talking. Several children had been talking but they quieted when she spoke. [Pa. 3/17/58.]

The children are noisy again. Teacher says, Wait a minute. I don't want any more noise or moving around in the room. We'll wait until everything is quiet. This is a school and everything is going to be quiet. [Ik. 4/18/58.]

This example also embodies IX:5:4 ("Impersonal Reprimand"), IX:8 ("Command"), and IX:10 ("'We' Technique").

IX:13. Group Sanction

The following example is from a class of fourteen-year-old unruly delinquent and near-delinquent children:

(The students are rehearsing a play. The teacher, Sa, is his own recorder. The record reads:) I notice Herb goofing[8] around while waiting for his cue, and I say Hold it, everyone, Herb is putting on his own little show. Let's take time out to watch him. Herb says, Aw, I'm not doin' nuttin'. Ben says, Yeah, he goofs around all the time until it's time to act and then who clams up[9] and acts stupid? Bob (the class bully) says, Let's get him. Bob goes to attack Herb, and the teacher says, Bob, we don't need that stuff. Herb will straighten up, won't you, Herb? Herb says, Aw, I ain't bothering nobody and I know my part. [Sa. 4/28/58.]

This example also embodies IX:24 ("Encourages Peer-Group Control").

Some teachers have been observed to encourage peer-group control in a more systematic and open way. When a child does something of which such a teacher disapproves, he may call upon the other students to "try" the culprit and punish him (Henry 1957*a*, 1959).

IX:15. Putting the Child on His Mettle

To put a person "on his mettle" is to convey to him that the situation he faces is a challenge. When a teacher, in order to keep his pupils quiet, says, "You are on your honor" (Sa. 3/??58), he is simply telling them that their ability to maintain discipline is a challenge to their "honor."

IX:19. Special Stratagems

Some teachers develop purely idiosyncratic stratagems for maintaining discipline, but these stratagems are interesting because any one of them might some day become relatively institutionalized. For example, the use of affectivity, excessive politeness, and turning the maintenance of discipline over to the students, now characteristic of some suburban schoolteachers in the United States (Henry 1959), are relatively new developments in disciplinary techniques for grammar-school children, but will probably become more generalized in American culture in the future.

IX:21. Using a Higher Power

Sometimes responsibility for discipline is shifted by the person who is disciplining the child to some higher authority, human or non-human. In the latter event, it might be a god or goblin who, it is claimed, will punish the child for misbehavior. In American schools, the higher power is generally the (very human) principal or vice-principal. Thus:

The teacher looks at the class disapprovingly, pauses, and says, Just a minute. This girl right here. Leave now. The best place for you is the principal's office. The girl leaves the room. [Pa. 3/17/58.]

IX:22. Exclusion

"Exclusion" is most commonly effected by sending the misbehaving child out of the room temporarily. Of course, this is also IX:23 ("Punishment"). An occasional teacher develops an idiosyncratic form of exclusion, such as the following:

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[8] To *goof* is to fail or to do nothing. "I goofed off" means "I did nothing when I was supposed to be busy." "I goofed" means "I failed" or "I made a mistake."

[9] To *clam up* means to become silent, i.e., to shut tight like a clam.

Teacher looks up and catches Katy over by her neighbor. Teacher says, Will you come over here please, and she points to the floor on the left side of her desk. Katy comes over and sits down on the floor next to the teacher's desk. [Se. 5/7/57.]

Again, this is IX:23. But the incident is coded also as IX:22 because Katy is subjected to a kind of exclusion in being separated from the rest of the class.

The multiplicity of techniques used by teachers to maintain discipline in American schools is related to the severity of the disciplinary problem; the severity of the disciplinary problem is related to the fact that the children are not interested in being educated; the children are not interested in being educated because of the lack of unity between education and the rest of the social sphere. It may also be that the children lack interest because the social goals are uninspiring even when they can be clearly perceived—and who can clearly perceive them? In that case there would be little impetus to that kind of order of which Pericles spoke in his panegyric, and hence the children would fall into disorder, which is the root of the problem of discipline.

X: WHAT IS THE RELATION BETWEEN THE INTENT AND THE RESULTS OF EDUCATION? [10]

Implied in the teacher-pupil relationship is that the teacher teaches something, let us say science, and that the pupil learns it. However, the teacher not only gives instruction in a subject matter but also does many other things—like being sweet or sarcastic, telling the child to stand up straight and take his hands out of his pockets, or giving a pat on the back. Thus the child may not only "learn science," but at the same time also learn to hate the sarcastic teacher or to love the benign one, to loathe standing up straight, to enjoy being patted on the back, etc., etc. A general theory of unintended learning should take account of this variety of things the teacher does as he teaches. At the same time it should try to include also his intent or purpose. Since, as the teacher practices his art, he has an intention, all teaching activity is a logical product of these intentions and what the teacher actually does. This formulation seems general enough to cover all cases of social learning. We may note in passing that all intentions are capable of translation into action—though some of them may never be so translated.

It is rarely true that a teacher has only one intention. Nowadays, most American elementary-school teachers seem to have a variety of them: they not only want to teach subject matter, but in addition they may want their students to be good citizens, to work hard, to live comfortably, to love their parents and the teacher, to be orderly, to have spiritual values, and so on. Accordingly, such teachers express this variety of intentions in a great variety of behaviors, which may or may not be logically related to their subject matter. We cannot predict the total consequences of this on a relatively responsive and plastic child. Even after the most careful observation and analysis of all of a teacher's actions and inferred intentions, much of what is learned by the pupil in the classroom remains, by and large, indeterminate. This fact need not, however, deter us from the attempt to study it. Of course, the more a teacher is trained to limit his intentions and his actions, the greater is the predictability of the consequences of his teaching.

To this point, we have been examining classroom learning with the teacher as the center of analytic focus. However, the pupils' potentialities for response to the teacher are central to analysis both of the relation between the intentions and actions of the teacher, on the one hand, and of what the student learns, on the other. For example, it is crucial to the understanding of a spelling competition that we be aware of the pupils' potentiality for response to a competitive situation, for, if the overwhelming majority of the children are not already competitive *children,* the spelling competition will fail. Again, we can comprehend a teacher's telling her pupils not to paint with dark colors because they indicate unhappiness, only if we assume that both teacher and students feel that unhappiness is somehow culturally unacceptable (Henry 1955*a*).

Such considerations enable us to draw the conclusion that *for the actions and intentions of the teacher there are, in all cultures, complementary responses and response tendencies in the pupils.* The complementary *response* can occur only if the teacher is able to mobilize the students' latent, culturally determined attitudes, but this he should be able to do because he is a product of the same culture as his students and should know intuitively their social character. The complementary *response* is therefore the response the teacher wants. Complementary *attitudes,* on the other hand, are latent, culturally standardized, tendencies to *give* the culturally acceptable response under the proper circumstances, e.g., a teacher's demand for the response.

Though complementarity exists when the pupil responds to the teacher as desired, e.g., he competes with his fellows when directed to do so as in a spelling competition, some children who *participate* actively might nevertheless *react* inwardly to the spelling competition *antithetically,* i.e., with anxiety and tendencies to withdraw. Thus, while it is probable that in the usual social-learning situation most of the attitudes of the children would be complementary, some could be covertly antithetical. Many might be neither complementary nor antithetical, but, rather, "indeterminate."

As an approximate definition of the term "indeterminate" let us say that an indeterminate attitudinal response is one not readily predictable from knowledge of the structure of the learning situation alone. If we ask, "Not readily predictable by whom?" the answer is (*a*) by the organizer of the lesson being taught; and (*b*) by the person who hears only a formal account of the lesson without being present at it. Indeterminate and antithetical responses are covert *meta*-responses—they *go along with* the lesson, but are features that the teacher, perhaps, would rather not have there. To illustrate, there follows material on a game of "spelling baseball" in a fourth-grade class observed by Henry (1955*a*).

[10] Previous publications on this problem are: Henry 1955*a*, 1955*b*, 1957*a*, 1957*b*; Rabin 1959; Spindler 1959.

Children form a line along the back of the room. There is to be "spelling baseball," and they have lined up to be chosen. There is much noise, but teacher quiets them. Teacher has selected one boy and one girl and sent them to front of room to choose their sides. As the boy and girl pick children to form their teams, each child chosen takes a seat in orderly succession around the room. Apparently they know the game well. . . . Now Tom, who has not yet been chosen, tries to call attention to himself, in order to be chosen. Dick shifts his position more in direct line of vision of the choosers so that he may be chosen. Jane, Tom and Dick, and one girl whose name Observer does not know, are the last to be chosen. . . . Teacher now has to remind choosers that Dick and Jane have not been chosen. . . . Teacher gives out words for children to spell, and they write them on the board. (Each word is a "pitched ball," and each correctly spelled word is a "base hit." The children move from "base to base" as their teammates spell the words correctly.) With some of the words the teacher gives a little phrase: "Tongue—watch your tongue: don't let it say things that aren't kind; butcher—the butcher is a good friend to have; dozen--12 of many things—knee—get down on your knee; pocket—keep your hands out of your pocket, and anybody else's. No talking!" Teacher says, "Three outs," and children say, "Oh, oh!" . . . "Outs" seem to increase in frequency as each side gets near the children chosen last. . . . Children have great difficulty spelling August. As children make mistakes those in seats say, "No." Teacher says, "Man on third." As child at board stops and thinks, teacher says, "There's a time limit; you can't take too long, honey." At last, after many children fail on August, a child gets it right, and returns grinning with pleasure to her seat. . . . (Observer notes: Motivational level in this game seems terrific. They all seem to watch the board, know what's right or wrong, and seem quite keyed up. No lagging in moving from base to base.). . . . Child who is now writing Thursday stops to think after first letter, and children snicker. Stops after another letter. More snickers. Gets word wrong. . . . (Frequent signs of joy from the children when their side is right).

In the above, we may note the following as probable indeterminate responses: (1) anxiety and feelings of depreciation in the children chosen last by the captains; (2) feelings of self-depreciation and hostility in the students subject to snickers; and (3) anxieties aroused by the teacher's random phrases, "get down on your knee," and "keep your hands out of your pockets and anybody else's." None of these responses could have been foreseen from a simple description of the game.

The next example is from a fifth-grade arithmetic lesson (Henry 1957*a*: 123):

Boris had trouble reducing 12/16 to lowest terms, and could get only as far as 6/8. There was much excitement among the students who were watching him at the board. The teacher asked him quietly if that was as far as he could reduce it. She suggested he "think." There was much heaving up and down from the other children, all frantic to correct him. Boris looked pretty unhappy. The teacher was patient, quiet, ignoring the other students while concentrating with look and voice on Boris. . . . At last, when Boris is unable to solve the problem the teacher turns to the class and says, Well, who can tell Boris what the number is? There is forest of hands and the teacher calls on Peggy who says that 4 should be divided into both the numerator and denominator.

It is obvious that Boris' failure made it possible for Peggy to succeed, and, since the excited handwaving of the children indicates that they wanted to exploit Boris' predicament to succeed where he was failing, it appears that at least some of these children were learning to hope (covertly) for the failure of fellow-students. Having been reinforced in this way during long years of schooling, the "I-hope-he-fails" attitude is common enough in the American character. It is an indeterminate, covert learning. If some teachers knew their students were learning to hope for the failure of fellow-students they would be horrified—provided they believed it was happening, since they certainly had no *intention* of teaching children to feel this way.

Many children have Boris' experience frequently during their school years, and possibly acquire a variety of indeterminate learnings over the long run. For example, they might learn hostility toward all successful children, fear of facing an audience, and hostility toward teachers, especially females (since most elementary-school teachers are females).

In addition to complementary, antithetical, and indeterminate responses there is still another *meta*response, which I have called *pseudo*-complementary (Henry 1955*b*). This is the response in which children, *without conviction*, give the teacher what they perceive she wants, and by so doing appear to be learning something they are not. In these circumstances, the lessons that are really learned are how to be docile—to give the teacher what she wants—and the importance of docility. This is not the same phenomenon as head-nodding in college, in rhythm to a professor's lecture, while inwardly denying the truth of everything he says. The latter is a feeble voice inwardly affirming autonomy, while *pseudo*-complementarity is real abandonment of it.

In sum, what a child learns (i.e., what responses are reinforced) is a result of the teacher's actions and intentions and of the child's own tendencies to respond. Out of the interplay between these grow complementary, *pseudo*-complementary, antithetical, and indeterminate responses on the part of the child. At any given time, any of the last three may be unintended by the teacher, and the only way for an observer to take account of them is by making an inventory of the response universe. Even then, the observer is still somewhat in the position of a man surveying space with a very small telescope: he can see some things and make shrewd guesses about others, but he also misses a great deal. However, in the absence of observation or inventory of the classroom response universe, we might imagine that all responses were complementary—that nothing happens in a classroom except the children's answers to the teacher's questions. A theory of social and unintended learning must include antithetical, indeterminate, and *pseudo*-complementary responses, and must anticipate them methodologically by an inventory of the response universe.

XI. WHAT SELF-CONCEPTIONS SEEM REINFORCED?

A teacher cannot avoid contributing to a student's self-conception, for human beings are self-concept-forming animals whose self-conceptions are in process of formation at every stage of learning. Among factors contributing to the formation of the self-conception are:

II. How is the information communicated (teaching methods)?
- 27*a*. Through ego-inflation
- 27*b*. Through ego-deflation

IV. How does the person being educated participate? (What is his attitude?)
- 11*b*. Ridiculing peers
- 26*a*. Hostile to peers
- 34. By carping criticism
- 35. By praising work of peers

V. How does the educator participate? (What is his attitude?)
- 13. Discouraging
- 14. Encouraging
- 15. Hostile, ridiculing, sarcastic, belittling
- 18. Personalizing
- 19. Depersonalizing
- 23. Accepting of child's spontaneous expressions
- 24. Rejecting of child's spontaneous expressions
- 27. Acts and/or talks as if child's self-image is fragile
- 28. Acts and/or talks as if child's self-image is irrelevant
- 34. Praises and rewards realistically
- 36. Critical (does not point out good things in student's work)

IX. What forms of discipline are used?

Of course, much of the conception of the self is formed during an early period of nurture within the family, but that early period is beyond the scope of this paper. Thus this section is confined to the question, "What are the results, for the conception of the self, of the behavior listed in sections II, IV, V, and IX?"

For anthropology, the importance of self-conceptions resides in the fact that they tend to be fairly uniform throughout each culture, and that social intercourse pivots on them. Thus the potlatch relationship between Kwakiutl chiefs is based on their recognition of each other's expansive self-conception (Benedict 1946); and supreme conformity to peer-group norms among American teenagers stems from their sense of personal inadequacy (Remmers and Radler 1957, especially tables on pp. 80–85). Our conclusion, similar to one derived in the preceding section, is that in all cultures there must be an institutionalized self-conception complementary to the cultural goals. This conclusion seems obvious enough, for it would certainly be disruptive if, in a culture like Hopi, where social life depends on severe subordination of individual drive to group goals, people learned a grandiose, individualized self-conception. A striking example of the relation between a poor self-conception and cultural goals is given by Mead (1939: Pt. II) for Manus. After describing the free, generous, unfettered, and independent life of the male children, she points out that this must be abandoned, and the adolescent boy's spirit broken, at marriage, in order that he may take a position at the bottom of adult society and start to learn the workings of the economic system. Gradually, then, he will work his way up to economic strength. Mead says ([1939] Pt. 2: 208–209):

> On all sides he must go humbly. He is poor, he has no home; *he is an ignoramous*. . . . He enters an era of social eclipse. He cannot raise his voice in a quarrel, he who as a small boy has told the old men in the village to hold their noise. Then he was a gay and privileged child, now he is the least and most despised of adults.
>
> All about him he sees two types of older men, those who have mastered the economic system, become independent of their financial backers, gone into the gift exchange for themselves, and those who have slumped and who are still dependent nonentities, tyrannised over by their younger brothers, forced to fish nightly to keep their families in food. Those who have succeeded have done so by hard dealing, close-fisted methods, stinginess, saving, ruthlessness. If he would be like them, he must give up the good-natured ways of his boyhood. . . . So the independence of his youth goes down before the shame of poverty. [Thus the young married men are] meek, abashed, sulky, skulking about the back doors of their rich relations' houses. [Italics supplied.]

Thus, in Mead's analysis, the debased self-conception provides the compensating dynamic of striving, so necessary for learning and succeeding in the Manus socioeconomic system.

On the other hand, the physical rigors and trials (see II:16*b*, 43:2) imposed on boys by many of the North American Indian tribes served to create a self-conception in which self-assurance and independence were conspicuous elements. Such self-conceptions were complementary to the daring and independence of action demanded by a rigorous life.

XII. HOW LONG DOES THE PROCESS OF FORMAL INSTRUCTION LAST?

It is very clear that one has to learn much more in American culture than in, say, Kaingáng culture (Henry 1941). Therefore, the time spent being educated must be greater in cultures with elaborate technologies and ideologies than in those with simple ones. Indeed, the period of education might have had to be prolonged indefinitely in highly elaborated cultures, where there is so much to learn. However, this problem has been solved in all the great civilizations by apportionment of different activities to different social groups. Correlatively, status rank has been assigned to the latter in terms of the former. Coinciding with this, there has been, of necessity, a proportionate relationship between social status and the time spent in getting educated: persons of higher status tend to spend more time being educated than persons of lower status, and persons who are mobile upward spend more time in educating themselves than those who are not mobile upward.

Interestingly enough, these generalizations seem to hold even at relatively primitive levels of culture where there is little differentiation into structural classes or castes. A boy in any primitive society has to learn adult male subsistence techniques, and he often has to learn ceremonial too. If he wants to become a shaman or priest, he has to learn the techniques and ideologies of that occupation. The point of stating such truisms here is that *time* is expended to achieve a *change of status*, which is regularly, but not always, a *rise* in status. In other words, commonly, though not universally, the higher one wishes to be in social status, the more time one has to spend educating oneself. We have already referred above to Pettitt's analysis of the relation between education and the exercise of supernatural functions in primitive North America (1946: 108 *et seq.*). Here it is only necessary to underscore that his material shows (1) the frequent correspondence between status change,

for example advancing in the priesthood or in a secret society, and the length of time spent in being educated, and (2) the direct proportion between time spent in learning about the supernatural and the *elaboration* of priestly and related functions.

It seems likely that in all educational systems, literate as well as non-literate, some assumptions must be made about *pace*. In Samoa nobody must learn too fast (Mead [1939] Pt. I: 33, 35), while in Taleland rapid learning is admired (Fortes 1938: 13). The pace at which education is conducted is, of course, related to the cultural dictate about how much of a life-span should be given to education. But a great deal of further research is necessary in cultures other than our own on the matter of pace and its relation to total cultural configurations.

Summary and Conclusions: Some Ancient and Abiding Characteristics of Human Education

1. Use of reward stimuli to learning: primarily praise, appreciation, and status elevation.

2. Use of pain stimuli to learning: ridicule, accusation, physical pain, physical confinement (restriction of movement).

3. Use of role-occupant as role-instructor (teaching of archery by archers, of agriculture by farmers, of warfare by warriors, of mathematics by practitioners of mathematics, of carpentry by carpenters, etc.) This has undergone radical change since the emergence of modern mass education.

4. In high civilizations: low status of teachers, unless they teach sacred matters.

5. In high civilizations: a correlation between (*a*) love of knowledge for its own sake, with (*b*) status of teachers, and with (*c*) the interest of students in learning.

6. Confinement of creativity to gifted individuals (creativity never a mass phenomenon).

7. Absence of the assumption of a natural impulse to learn. (This does not mean that children are not everywhere naturally investigative, but there is no evidence that children will not lose interest in learning when it requires work.)

8. Congruence of status change with education, coupled with definite marks of adult recognition of status change.

9. Unity of the social sphere, including education, in non-literate cultures outside the stream of industrialization.

The main point deriving from this cross-cultural study of education is that *Homo sapiens* learned long ago that there is no such thing as "natural maturation" in a social sense, and that the central problem for human beings is the adaptation of each new generation to culture. This includes learning the techniques for survival each particular culture has found reliable.

It would appear that, on the whole, adult *Homo sapiens* has rarely taken it for granted that children could or would just naturally learn by spontaneous imitation. At the same time, the children of *Homo sapiens* have not assumed that they would just naturally grow into adulthood. Rather, children have always been aware that they have to validate their status as adults by learning adult techniques from older teachers. It follows that *Homo sapiens* has been born on a kind of status machine—a status escalator or a status treadmill, depending on the culture—from which there has rarely been any socially acceptable escape. Thus, throughout his historic course, *Homo sapiens* has been a "status seeker," and the pathway he has had to follow, by compulsion, has been education. Furthermore, he has always had to rely on those superior to him in knowledge and social status to enable him to raise his own status. On the other hand, it is not clear that adults have always assumed that children would naturally wish to be adult. Over and over again, the data shows that children have had to be urged up the status ladder by rewards, punishments, and other even more complex devices. From the point of view of the adults this is absolutely necessary, for otherwise the children would remain dependent and disgracefully deviant in other ways. From the standpoint of the child, he must climb the status ladder or suffer the consequences of dependence and deviance. It is likely, meanwhile, that this compulsion and the inner conflict involved leave a lasting impression on the child, so that as a mature adult these memories can provide a fertile soil for social change, for if conditions arise that seem to provide an opportunity to eliminate the sources of the pains of childhood growth, adults may be happy to take advantage of the situation and push for change, often, perhaps, not knowing the real sources of their readiness.

Also deriving from this study is an insight into the enormous effort that *Homo sapiens* has put into narrowing the perceptual sphere of the individual. To this end he has employed ridicule, praise, torture, admonition, etc., etc., with all the ingenuity his great brain has been able to devise. Thus, though *Homo sapiens* has been also *Homo inquisitor*—man the curious, the inquirer—he has always worried that his careful arrangement of cultural patterns would be destroyed if he *learned without limit*.

Finally, protecting himself from *inundation by stimuli, Homo sapiens* has erected the categories of his languages and his culture patterns. Of course, in the long run these intellectual walls crumble because of the inherently variable mental constitution of *Homo sapiens*, because many devices he uses for narrowing the perceptual sphere are unrewarding and self-defeating, because of the polyphasic nature of human learning, and because of the indeterminate factors that are always present in human learning. Thus, the dialectic of man's effort to understand the universe has always decreed that he should be alternately pulled forward by what has made him *Homo inquisitor* and held back by the fear that if he knew too much he would destroy himself, i.e., his culture. So it is that though language has been an instrument with which man might cleave open the universe and peer within, it has also been an iron matrix that bound his brain to ancient modes of thought. And thus it is that though man has poured what he knows into his culture patterns, they have also frozen round him and held him fast.

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OUR READERS WRITE

(*Continued from page 266*)

Reprinting

In the pre-issue of CURRENT ANTHROPOLOGY there was raised the question of reprinting in English important articles that had appeared in obscure publications or in languages with which most anthropologists are not familiar. The Editor asked Associates to express their views and to suggest articles that might be reprinted.

Of the 800 Associates who returned Reply Letter #1, 95 replied to this question. Some misinterpreted it as a request for titles of articles by themselves that CURRENT ANTHROPOLOGY could reprint. Others mistakenly assumed that the titles of the proposed review articles listed in the pre-issue were actually titles of articles being considered for reprinting, from which they were to choose one or more. Despite such misunderstandings, however, several inferences can be drawn about the kind of reprints Associates desire.

Sentiment against reprinting, or reservation about the value of reprinting, was expressed by eight Associates. Four of these (1—Australia; 3—U.S.A.) opposed reprinting entirely or would hold it to a minimum, because (1) CURRENT ANTHROPOLOGY should be an outlet for new material, and (2) most journals are now distributed widely, or are available through library loans. Of the other members of this group, two Associates (Australia, Portugal) want reprints limited to translations of important articles in languages such as Russian and Japanese. The other two Associates (South Africa, U.S.A.), however, want abstracts of such articles rather than full translations; and one of these suggested a regular section of CURRENT ANTHROPOLOGY for volunteered or solicited abstracts of such articles.

Eighty-seven Associates favored reprinting. A number of these simply endorsed the idea, but others indicated the kinds of materials that CURRENT ANTHROPOLOGY should reprint, or suggested particular articles.

Associates who recommended classes of materials tended to make very similar choices:

Soviet ethnographic and ethnological articles on the peoples of Central Asia and/or West Africa. (U.S.A.)

. . . important articles from Soviet publications in anthropology. (U.S.A.)

English translations of articles appearing in the new "Anthropology Journal," Moscow. (England)

. . . articles in languages that few anthropologists can read (e.g., Russian and Chinese). (Germany)

Translations of important ethnological publications in Chinese, Japanese, and other non-European languages, or in Slavonic and other European languages with which the average West-European and U.S.A. student is not familiar. (Germany)

. . . articles published either in not generally known periodicals, or in Russian or the Far-Eastern languages. (Germany)

. . . material on Indonesia in Dutch, or material by Japanese ethnographers and sociologists. (Australia)

. . . articles on Chinese languages and dialects, originally appearing in Chinese publications . . . (U.S.A.)

Translations . . . of important articles in Chinese and Japanese. (Hong Kong)

Selections from the journals on minority peoples published by the SW Associated University in Kunming during the war. (Japan)

One Associate asked for articles from early issues of the *American Anthropologist;* such a collection has now been published by the American Anthropological Association.

A greater variety is shown by requests for specific articles, in which no general trend can be seen:

BELL, J. H. Field techniques in anthropology. *Mankind* [1954] 5, No. 1. (U.S.A.)

BLOCH, BERNARD. A set of postulates for phonemic analysis. *Language* [1948] 24: 3–46. (U.S.A.)

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DUMONT, LOUIS. *Une sous-caste de l'Inde du Sud.* (U.S.A.)

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FORDE, DARYLL. The cultural map of West Africa: Successive adaptations to tropical forests and grasslands. *Transactions, New York Academy of Sciences,* Ser. 2 [1953] 15: 206–19. (U.S.A.)

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LUCK, J. MURRAY. Man against his environment: The next hundred years. *Science* 126:903–908. (U.S.A.)

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(*Continued on page 346*)

Human Ecology During Pleistocene and Later Times in Africa South of the Sahara

by J. Desmond Clark

THIS IS an attempt to bring together the evidence of the cultural remains found in such profusion in the vast region of Africa south of the Sahara and to show what can legitimately be deduced from such evidence about the relationship between man and his environment throughout the various stages of prehistoric time. It is also an attempt to outline what may be inferred concerning the social and economic organisation of succeeding cultural stages.

Africa is important in this respect, because it has provided us with our most valuable knowledge about the living places of the earliest human societies. The extremely significant finds in China (Choukoutien), western Asia (Mount Carmel), and the more southern parts of Europe have included the less perishable material culture in quantity, and their contribution to our knowledge of, for example, food resources, use of fire, and the nature of the stone and bone equipment, is, of course, immense. But, as most of these finds come from cave sites, it is rarely possible to determine individual floors within the compacted occupation material in the deposits, therefore, as yet, they have not provided much evidence of floor patterns. Also, in higher latitudes subjected during the Pleistocene to glacial and peri-glacial climatic conditions, occupation sites in the open seem rarely to have survived except in loess regions; and tools from river gravels can never yield more than a small proportion of the clues necessary to interpret something of the way of life of their makers. In Africa we have been more fortunate, in that not a few of our discoveries have been undisturbed living sites in the open.

Certain data are essential to any study of the life of early man, if the results are to have lasting value.

Firstly, it is necessary for the *chronological framework*, from which a cultural succession is built up, to be established on a firm foundation and correlated on a continent-wide basis. The relative chronology for Africa, based on successive geological deposits, on faunas and cultures set in a presumed framework of fluctuating climates, still lacks the completeness obtained for other continents, and as yet absolute dating by Carbon-14 or the potassium–argon method is very much in embryo even for the later stages. Generally, however, while doubt exists as to the validity of some of the climatic interpretation, the broad chronology based on a succession of lithological units, fauna and culture need not be disputed, though a very great deal of detail still needs filling in.[1]

Secondly, it is necessary for sufficient *classificatory work*—taxonomic, if you like—to have been done to enable the various industries and technical processes to be pidgeonholed correctly, in accordance with the es-

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CLARK has done field work in Northern Rhodesia and Nyasaland, in the Horn of Africa, and in Angola. He is the author of *The Stone Age Cultures of Northern Rhodesia* (Cape Town, 1950), *The Prehistoric Cultures of the Horn of Africa* (Cambridge University Press, 1954), and *The Prehistory of Southern Africa* (Penguin Books, 1959), as well as of papers in a number of scientific journals.

The present paper, submitted on June 9, 1959, was sent to twelve scholars for CA☆ treatment, of whom the following responded with written comments: Robert J. Braidwood, J. G. D. Clark, H. B. S. Cooke, F. Clark Howell, B. D. Malan, Kenneth P. Oakley, and Roger Summers. CLARK has incorporated several of their suggested amendments or improvements in the text, and discussed others in the footnotes. He wishes to express his gratitude to these scholars, and also to Irven DeVore, discussion with whom has helped him to "a clearer perception of the possibilities and limits of group behaviour among the earliest hominids."

[1] H. B. S. Cooke (1958) and Flint (1959*a*, *b*) have recently cast doubt on the climatic interpretations of the East African stratigraphical succession and have shown that the previously accepted framework of four "pluvials" separated by three "interpluvials" or "non-pluvials," while it may be the right one, is, on the available geological evidence, not yet proven to the satisfaction of geologists. The climatic interpretation of the geological evidence for the last pluvial and subsequent wetter periods is acceptable, but since it cannot be ruled out that tectonics, as well as climate, could have been responsible for the appearance and disappearance of the earlier Pleistocene lakes, the sediments represented by the rock units contained in their basins could equally well have been the result of earth movement, causing damming, diversion, or reversal of water resources. Since the East African climatic interpretation

sentially African terminology that is now universally adopted. As this must lie behind any study of prehistoric societies, it is not surprising that there is a wealth of material available for Africa (Goodwin 1946; Cole 1954; Clark 1959*a*).

Thirdly, we need to know the *spatial distribution* of our cultures and industries and also of certain specialised forms of tools. In other words, we need good distribution maps setting forth the regional spread of specialised culture patterns, industrial units, and individual forms. In this we are at present sadly lacking. For the Union of South Africa, where prehistoric research has been carried on since 1858, there are as yet no such maps, with the exception of one for prehistoric art groups. For most parts of East Africa we fare no better; and in others investigations have not even begun. In fact, for not more than half a dozen African territories do adequate distribution maps at present exist. However, the preparation of such maps is already under way for southern Africa and, it is expected, will shortly begin for the entire continent.[2] (See J. G. D. Clark [1].☆) Air photography is as yet little used by the archaeologist, mainly because it has a rather limited application in the African bush where vegetation usually obscures topography, though good possibilities exist where there is intensive agricultural activity.

Fourthly, it is essential that the *environment and ecological setting* of cultures in each case be established as accurately as possible, for, without this knowledge, we can hardly begin to interpret the cultural evidence (see J. G. D. Clark [2]☆). It is necessary to know the nature of faunas, of vegetation and climate, of kinds and forms of raw material (both stone and other) available to man, and so on. Here, to a very great degree, the archaeologist must rely on workers in other disciplines —geologist, palaeontologist, ecologist, palaeobotanist, soil chemist, and geographer, to mention but a few. It is now fully apparent that unless there is teamwork with other disciplines we cannot hope to extract more than a fraction of the evidence that in many instances our sites could yield. For example, only within the last five years have the possibilities of palaeobotany been appreciated with regard to tropical regions, but now palynology has made a good beginning in Africa and is going to be of the greatest importance to the archaeologist (Bakker 1958). Again, techniques for the study of fossil soils, such as those evolved by Brain (1958) in South Africa and Bond (1957*a*, *b*) in Rhodesia, are invaluable for indicating degree of climatic change, and they need a far wider application. Only teamwork of this kind will produce the evidence we need so badly, and, as yet, such teamwork is all too often a rarity in Africa, though in Europe and the United States, for example, it has long been a recognised feature of Quaternary research (see J. G. D. Clark [3]☆). In Africa one man all too often tries to undertake all this work and fails, though this may frequently be occasioned by the inadequate number of workers and the large field that each has to cover.

Fifthly, it is necessary to be *selective in the choice and excavation of sites*. Only camping and settlement sites will provide evidence of the nature of the home itself, of the settlement pattern, and of the groupings of the people who lived there. Sealed sites in the open yield better evidence of this kind than do cave sites, even though a greater wealth of cultural material may well be found in caves. Excavation technique must be of the best, especially for the earlier sites, since the older such sealed living sites are, the rarer they become. Unfortunately, it must be admitted that in Africa techniques rarely attain the high standard that the work requires, and it is hardly necessary to point out that once a site has been excavated, any evidence that has not been preserved has been destroyed and lost forever.

Recently, excavation techniques usually adopted only for sites of Neolithic and later age have been applied to Palaeolithic sites. These techniques, by which the whole or a good part of the site is uncovered and the spread of the occupation material accurately recorded, have been used to very good effect by Leakey (1952, 1958) at the Earlier Stone Age sites of Olduvai, Olorgesailie, and Kariandusi in East Africa; by F. Clark Howell (Howell, Kleindienst, and Cole 1959) at Isimila in Tanganyika; by Mason (Mason, Dart, and Kitching 1958) at the Middle Stone Age site of Kalkbank in the Transvaal; and by the writer at the Earlier and Middle Stone Age sites at Broken Hill (Clark 1960) and the Kalambo Falls (Clark 1954).

Sixthly, *surviving ethnographic evidence* must not be overlooked. Selective consideration of ethnographic parallels from studies of existing primitive peoples in similar stages of culture can help considerably to fill out the picture obtained from archaeological material cul-

has been applied by archaeologists to most other parts of the continent, the doubt that has now been cast on the interpretation of this succession in the type area must pertain to these other regions also. The succession in southern Africa is based on the interpretation of river-valley morphology, cutting and filling by streams and the distribution of aeolian sands. As there has been little significant earth movement in the sub-continent since the beginning of the Pleistocene, it would seem that the tectonic factor can be discounted, and it is difficult to see what agency other than climate might have produced the uniform pattern of four cycles of cutting and filling that has been established in many river basins there. It is on these geological sequences, together with the associated successions of fauna and artefacts, that correlation work within the continent has been attempted. Even though much work remains to be done before the pluvial and non-pluvial succession is established to full satisfaction, the broad faunal and cultural divisions provide a reasonably sound basis for correlation, as do also the different time horizons evidenced by the redistribution of aeolian sands in regions covered by sands of Kalahari type. Although the earlier part of the established climatic framework is now under a cloud, and only further geological evidence on the mechanics of sedimentation and soil formation will dispel it, yet we should not, because of this, "throw out the baby with the bathwater"; and the climatic interpretation of the later Pleistocene cycle of erosion and sedimentation in southern Africa now being confirmed by pollen analysis serves to indicate that similar phenomena in previous cycles may have a similar interpretation. This essay is not the place to discuss in detail the validity of the interpretation of the Pleistocene climatic succession in southern Africa, and readers are referred to the various authoritative works on this subject which present a great deal of evidence, though in some cases further investigation is necessary before the interpretation given can be finally confirmed. It can hardly be doubted that climatic changes were generally responsible for the erosion and sedimentation cycles in the river valleys in southern Africa, but it is the climatic inferences drawn from the geological evidence that are sometimes in dispute due to insufficient observation of the mechanics involved. (See, e.g., Brain 1958; H. B. S. Cooke 1946; Söhnge, Visser, and Lowe 1937; Janmart 1953; Leakey 1949; Dixey, in Clark 1950; Visser and Lowe 1955; Bakker 1957; Bakker and Clark 1960; Poldervaart 1957.)

[2] It should be borne in mind, however, that until ground survey has been carried out evenly over the whole territory, distribution maps will reflect the contemporary state of prehistoric research in particular regions. In order that this be not forgotten, the extent of research should always be indicated, so that the cultural distribution pattern may be viewed in its right perspective.

ture alone, though an uncritical use of such evidence is to be deplored (see J. G. D. Clark [4]☆). Bushman and Pygmy groups, pastoral Hottentots or Bantu mixed farmers and agriculturalists, preserve for us today living evidence of what some of our later pre- and proto-historic African cultures were like. Indeed, they are sometimes the living descendants of those cultures. Not nearly enough use has up to now been made of this important ethnographic evidence, nor of that preserved to us in the prehistoric art groups found in certain regions from the Horn to the Cape. Here is a most valuable record of racial characters, weapons and tools, food-collecting and hunting practices, dietary preferences, magico-religious beliefs and customs connected with initiation, death, and so on. This wealth of material has barely begun to receive examination from an ethnological point of view, and more analytical work of the nature of that initiated by C. K. Cooke (1958) is badly needed. A co-operative study of this art by ethnographer and archaeologist would give most valuable results.

Early investigators not infrequently had a less narrow outlook on prehistoric matters than some of their successors. For example, they did not neglect to draw parallels between the remnants of the Bushman peoples and the later prehistoric cultures. Unfortunately, their lack of critical approach and of selectivity rendered much of their work of dubious value and thus caused later investigators to concentrate on the narrower, but then more reliable, fields of typology and stratigraphy. The observation of one, Martin (who rejoiced in the pseudonym of "Barnacle" on account of his interest in strandlooping sites), that grind-stones associated with many of these Later Stone Age middens were used as "gravy dishes for the epicures among the natives," leads one to suspect that his knowledge of the life of hunter-gatherers did not go very deep (Martin 1872). The portrait painted by another early writer, of prehistoric man using his "rounded and notched nerve-scraper, preparing the skins of wild animals for his daily habiliments," at least shows a more practical interest in the ethnographic approach (Barber 1872). And the title of yet another early paper, "Evidence on the Antiquity of Man in East London, Cape Colony, with a Note on the Castor Oil Plant" (McKay 1896), shows that the study of early man was still regarded as closely allied with natural history, unless it be that some more subtle nuance is implied!

In short, in Africa south of the Sahara much spade-work has still to be undertaken, but not a little material is now ready for synthesis.

Before we consider what may be deduced and inferred from this material, the reader is reminded of the fact that it was during times of climatic change and, in particular, of *drier* or non-pluvial climatic conditions, that the most rapid changes in technology occurred, if we may take the imperishable equipment, which is often all that has been preserved, to be a true reflection of a culture as a whole (Summers [16]☆).

Five of these dry (non-pluvial) periods have been recognised in widely separated parts of the continent.[3] The first saw the introduction of tool making. The third saw the important technical advance that marks the change from the Earlier to the Middle Stone Age. The fourth coincided with the transitional cultures that herald the microlithic revolution (Clark 1959*a*). Finally, the fifth seems to have been responsible in southwest Asia for the fundamental change from food collecting to incipient food producing. (See Howell [6].☆)

These drier periods seem to have been times of cultural "speed-up"[4]—times of relatively short duration compared with the intervening wet periods, when new ideas and new forms were able to spread with greater ease throughout the continent and when less favourable living conditions stimulated man's powers of invention toward improved methods of securing food and more comfortable living quarters (an example, as J. G. D. Clark☆ has pointed out, of Toynbee's concept of "Challenge and Response" as a main explanation of the historical development of human society).

On the other hand, as soon as technical ability permitted (that is to say, from the end of the Earlier Stone Age onwards), the long periods of wetter climate made for stability,[5] slow development, and isolation of

[3] The terms "wet" and "dry," "pluvial," and "interpluvial" (or "non-pluvial") are used here in a purely relative sense, and it is in no wise implied that rainfall greatly increased or diminished during such times. "Pluvial" conditions need not imply that rainfall was much above the present mean for any given region, but it is likely that rainfall was more regular and more evenly distributed, so that important changes in vegetation patterns and in surface-water supplies could have resulted. For example, it is unlikely that, even at the height of a "pluvial," the climate ever improved beyond the semi-arid in the Horn or in South West Africa (see also Bond 1957*b*).

[4] Howell☆ says he "doubts the validity of 'cultural speed-ups.'" But, for example, radio-carbon dates and stratigraphical evidence indicate that the drier periods at the beginning and end of the Upper Pleistocene were of shorter duration than the anterior and intervening wetter phases. The pre-Gamblian drier or non-pluvial phase dates at the Kalambo Falls to between 43,000 and 40,000 B.P. ("before present") (Clark 1959*c*). Though it must be allowed that these dates most probably do not represent the extreme upper or lower limits, this period would seem to have been of shorter duration than the succeeding Gamblian Pluvial which, on C-14 results from Kalambo, Florisbad, the Cave of Hearths, and northeastern Angola, lasted from approximately 40,000–35,000 B.P. to 12,000 B.P. The post-Gamblian drier period seems to have lasted (with the same proviso), on C-14 evidence from Kalambo Falls and Mufo, Angola, from 12,000 to 9,000 B.P. The cultures of the First Intermediate period—the regional Sangoans and the Fauresmith—cover the time of the pre-Gamblian drier phase, while the Second Intermediate Magosian industries are the cultural forms found during the post-Gamblian phase. These cultural stages represent periods of typological and technical change in the stone cultures which, on chronological evidence, can be shown to have been relatively rapid and of short duration by comparison with the slower development of the Chelles-Acheul, on the one hand, and of the Middle Stone Age cultures, on the other.

[5] See Malan [11].☆ The significant point here is that favourable environments, i.e., where precipitation is not deficient, make for stability of culture at primitive subsistence levels, so that there is no economic need for groups to move out of their traditional territory. When, however, this stability is upset by climatic change or some other cause, the balance with the environment is overthrown, with the result that the population has either to adjust its culture to the new conditions or to migrate. It is perfectly possible for individuals and whole tribes to move half the length of the continent in a very short time, as Malan states, but they will do so only if the *need* to move is sufficiently pronounced. Such necessity is basically economic, especially for the hunting-collecting level of culture.

I would have thought that during wetter periods the contrast between forest and savannah was generally less, not greater, though temperature change is equally as important a factor as precipitation in influencing vegetation patterns.

Naturally many factors, of which Malan has mentioned some, come into play in building up culture tradition, and not simply that it was less easy to move about physically when the vegetation

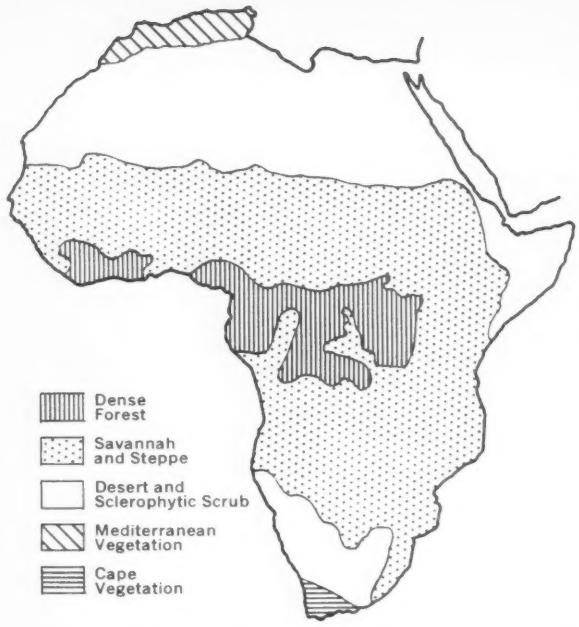


FIG. 1. Map showing simplified distribution of vegetation patterns in Africa. (After Schnell 1957.)

groups, and so resulted in a number of contemporary regional cultural variants.[6] Such variants may be taken to reflect the nature of the environment in which they flourished, for it must be accepted that the greater the adaptation of culture to environment among hunter-gatherers, the more efficient will be their economy (Steward 1955) and thus the greater their chance of survival. Generally speaking, the environment in Africa south of the Sahara today is much of it tropical and does not permit easy intercommunication among peoples to whom neither the pack animal nor the wheel penetrated until recent times. But an amelioration of the tropical environment during times of decreasing rainfall may be expected to have opened corridors and sometimes highways from north to south and from east to west, which seem to have invited, even though they also sometimes sidetracked, movement by groups forced to migrate by the deterioration of their traditional environment. Sometimes biological proof, in the shape of human fossils, confirms this.[7] At other times we have to rely on different evidence, for example the patterns of spread of new items of cultural equipment. Contact between bands naturally encourages the spread of cultural traits, and new inventions or techniques may be surmised to have been speedily transmitted at times of ecological change and population movement. Also, most hunter-gatherers appear to be exogamous, patrilineal, and patrilocal, and the assimilation of aliens seems generally to present them with few difficulties. Indeed, such ease of adoption has been established for other primates (e.g., baboons). It is small wonder that the idea of tool making, once conceived, should have spread so rapidly among the earliest hominids.

LOWER PLEISTOCENE AND PRE-CHELLES-ACHEUL INDUSTRIES

So far we know little about the living places of the earliest tool makers. These date to the end of the Lower Pleistocene. Relevant sites are few, and it is only since 1956, when Brain and Robinson discovered pebble tools in association with *Australopithecus* and *Paranthropus* at Sterkfontein and Swartkrans, respectively, that it became apparent that the Australopithecines not only used tools but most probably also made them and thus represent the first hominid stage. Confirmation came most dramatically with the Leakeys' discovery, in 1959, of the skull of the *Paranthropus*-like hominid, *Zinjanthropus*, on a living floor 25 feet down in Bed I at Olduvai Gorge. *Zinjanthropus* was associated with pebble tools and flakes and the dismembered remains of small and juvenile mammals, reptiles, etc., which there would seem little doubt formed part of the food of this Australopithecine. But the Australopithecine dentition (Robinson 1954; Leakey 1959) shows that vegetable foods also formed a very important part of their diet—probably, to begin with, the primary part. However, with the introduction of tool making and thus the greater proficiency in dealing with meat, they were increasingly able to satisfy better their carnivorous tendencies. The skinning and dismembering of kills required sharp tools, most commonly stones, and where such occur in nature there would have been no problem. However, in areas where the harder rocks were found only as erratics (most commonly as rounded pebbles) in sedimentary deposits, it would have become necessary to make sharp tools.[8] The pebble choppers, small utilised flakes and polyhedral stones (cutting and

pattern was more closed in "pluvial" times. But this does not invalidate my general contention that times of increased precipitation in southern Africa made for stability of population and culture.

[6] Well seen in the regional variants of Middle Stone Age times, and carried even further during the Later Stone Age.

Howell [7]☆ considers that cultural variants were present in Middle Pleistocene times in Africa. I would agree that the "Hope Fountain type" flake industries might be described as a "variant" of Chelles-Acheul culture (Clark 1960; Posnansky 1959*a*), but, I think they should be interpreted not as regional variants but as "occupational variants," since they are found in most of the main regions of southern Africa. Again, it is true that the regional form of the Acheulian in the Vaal Basin differs from that in the Cape, the Zambezi, or at Olduvai, but these differences, it is submitted, have been brought about by the *form* and sometimes the nature of the raw material most commonly employed. Handaxes and cleavers may be made from andesite flakes struck from large boulders by the proto-Levallois technique on the Vaal, from quartzite or chalcedony cobbles in the Cape or the Zambezi, or from obsidian or lava rock outcrops in East Africa; but the form of the finished implements shows little variation outside the temporal development within the culture complex as a whole. Thus, for example, virtually the same end-products resulted at the Erg Tihodaine in the Sahara, in the Kimberley district of the Vaal in South Africa, and in the Madras district of southern India. It is the remarkable uniformity of the end-products of Chelles-Acheul culture, from one end of the territory over which it spread to the other, that is one of its chief characteristics. Thus the variations that exist in Acheulian culture result, in the writer's opinion, from their makers' applying the limited technical processes available at that time to the different *forms* of raw material, not from specialised, regional economies, as can be postulated for First Intermediate and Middle Stone Age times. They are not, therefore, "variants" in the sense employed in this context.

[7] I.e., the evidence of skeletal remains of Afro-Mediterranean or "Erythriote" type in southern Africa, from the end of later Pleistocene times.

[8] I.e., on the middle Vaal, and in much of those regions where the soft rocks of the Basement Complex predominate at the surface.

FIG. 2. Map showing distribution of sites referred to in text.

smashing tools), which are almost the only artefacts found at this early time, can best be explained by this fundamental need. They betray an experimental crudeness in technique suggesting not only an early stage in, but rather the beginning of, the development of technical aids. This would confirm Oakley's (1957) suggestion that tool making may have developed comparatively suddenly so that the Oldowan type "pebble tool" represents, not the final stage of a long evolutionary development from simpler tools of this kind, but the initial stage itself.[9]

While the collection of vegetable foods must have been comparatively easy, the acquisition of meat would have presented greater difficulties. A good deal no doubt, especially large animals, could have been obtained by scavenging, and this is still a well-known prac-

[9] Bishop (1959) has recently shown that the so-called Kafuan Stage probably does not exist. The distinction between the Kafuan pebble tool—i.e., flaked from one face only—and the Oldowan form—i.e., flaked from two or more faces—is no longer a valid method of differentiation, since it is determined, in the writer's opinion, by the form of the raw material. Where the pebbles from which the implements were made are flat, the most effective cutting edge can be obtained by flaking from one face only. Where the pebble is chunky and as broad as it is long, it is essential to try to reduce the thickness and to flake it from at least two faces to obtain an effective cutting or chopping edge.

tice among some primitive human societies to-day.[10] But for the hunting and killing of even small game it would have been necessary to group together, and in such a necessity can be seen the beginnings and the development of the band. There is evidence to suggest that small game may have been driven into swamps or water, or cornered in caves or on rocky ground and perhaps despatched by clubbing and stoning.[11] Leakey's (1958) excavation of the somewhat later BK 2 Site at the unconformable junction of Beds I and II at Olduvai showed that a gully filled with sticky swamp clay had been used by Chellian man, most probably on several occasions, for driving and bogging down game which he then dismembered and ate on the adjacent bank. This driving and "bogging in" of game has been practised in Africa until recent times, and it is probable that some of the Pre-Chelles-Acheul open sites were kill sites of this nature. The fauna associated with the Taung child and with *Zinjanthropus*—lizards, tortoise, crabs, small baboons, pigs, antelopes, and other juvenile mammals—probably reflects best the Australopithecine standard of hunting efficiency, and, where the remains of large animals form a significant percentage, they were most likely acquired by scavenging (i.e., "Limeworks," Makapan Valley).

The evidence put forward by Dart (1957) in support of his "osteodontokeratic culture" suggests that the Australopithecines made use of any natural tools that were ready to hand and suited to the purpose of the moment. A long bone or half a mandible from their meal debris would have served as an efficient clubbing or ripping tool, while natural stones such as are found in the Sterkfontein deposit could have formed equally effective missiles. The only bone tool showing definite evidence of utilisation is the pointed fragment from Sterkfontein (Robinson 1959).

We have only a half dozen or so sealed sites that may in any way be recognised as living or kill sites of these earliest hominids, though their stone implements are found also in river gravels and marine beaches of this time. At Aïn Hanech in Algeria (Arambourg and Balout 1952; Balout 1955) the site was a lakeside one, as was also the *Zinjanthropus* site at Olduvai (Leakey 1959). Other sites are all in the open by lakes or rivers, with the exception of those in the Transvaal Caves, and Taung on the Kaap Escarpment. It is possible that caves had been used as temporary homes by the Australopithecines, but there is as yet no indication, unless they alone can be held responsible for the quantity of dismembered faunal remains, that their occupation was anything more than very transitory. They could not have been occupation sites in the true sense, for as yet no factory debris has been found with the "pebble tools" at Sterkfontein or Swartkrans, such as are found with all except the most temporary of Stone Age habitation sites. Perhaps, therefore, the association of a comparatively small number of stone implements with a much greater selective accumulation of broken animal bones with the Australopithecines at Sterkfontein and Swartkrans can be accounted for by regarding these caves primarily as watering places. Since water is rarely found on the surface in flat or undulating, dry dolomite country, the pools in the bottoms of the caves would have provided almost the only permanent supplies. At the same time as taking water, these earliest hominids may also have turned the caves to good use as butchery places where they could lie up and attack other animals using the waterholes. The associated fauna could result partly from successful kills eaten on the spot, partly from meat carried into the cave to eat near the water, and partly from non-primate occupation by carnivores.

The stone tools of this time show no significant typological variation from one end of the continent to the other, and at the few sealed living sites they are found distributed as a thin lateral or vertical scatter, lying in small patches and never as a continuous concentration over an extensive area (cf. Aïn Hanech [Arambourg and Balout 1952; Balout 1955], Lochard [Bond 1946 and Jones 1946], Harrisdale on the Vaal [Lowe 1953], etc.). This absence of heavy or extensive concentrations of tools on these pre-Chelles-Acheul sites suggests that the Australopithecine bands may not have been very large. Any attempt to assess the size of the bands and group behaviour at this time, however, cannot fail to take careful account of observations of non-human, primate behaviour (Washburn 1957, 1959; Carpenter 1942; Bartholomew and Birdsell 1953; Scott 1958; Gavan 1955; DeVore MS; and many others).

The great apes, being adaptively specialised to a forest environment and vegetable foods, are organised in small family groups, so it is usually supposed, although larger groupings have also been recorded. Gorilla troops observed by Schaller (1959) comprised 8, 15, 5, 18+, and 11 individuals, though at times the first three troops would join together and sometimes nest within a hundred yards of each other. But the earliest hominids were omnivorous, living in open country. Probably, therefore, it will be from studying the behaviour of open-country primates such as the baboon, rather than the forest-dwelling forms, that we may learn most about the possible habits and group organisation of the first bands of tool makers. Thus Oakley [13]☆ stresses "that if the earliest hominids were comparable with baboons, the members who were in group contact at any one time may have fluctuated as widely as between 20 and 200, depending on the scarcity or abundance of food supplies." So far as the composition of the Australopithecine bands is concerned, it will probably never be possible to give any accurate indication, and all that can be said at present is that, on analogy with the gorilla and baboon, there would have been a greater number of adult females than adult males, together with a number of immature individuals of both sexes.

Since all primate groups, or for that matter all vertebrates, keep to a clearly defined range of territory, it is safe to assume that this habit had a major effect upon Australopithecine behaviour. One gorilla troop ob-

[10] Juveniles are still, or were until recently, sent out in the early mornings by the Mashi River tribes (17°00'S, 22°46'E) to locate where vultures were flying, thus pinpointing the place where a carnivore had made a kill. The villagers could then recover the meat. See also sixteenth–nineteenth-century descriptions of strandlooping Hottentots at the Cape.

[11] The following observations made in Northern Rhodesia may be of interest here. The writer was present when a hare was run down and caught among rocks by two Africans, by no other means than shouting and bare hands. R. R. Inskeep was present when one African caught a bushbuck by chasing it over a rocky hillside, cornering it, and killing it with his hands. Also, the throwing of stones when chasing animals has been observed by the writer on a number of occasions.

served by Schaller (1959) rarely moved more than half a mile a day, but the ground-dwelling baboons living in open country range farther but not more than two to three miles from their sleeping places (Haddow 1952; DeVore MS). Primitive hominids practising group hunting may be expected to have needed a wider range of territory, though not as extensive as that of the predatory animals (Murie 1944), or of human hunter-gatherer groups (Clark 1959*a*). However, as DeVore has pointed out (MS), a primate group living on the ground is much more vulnerable to attack by predators, so that the more restricted the territory, the more intimate would be the knowledge of it and the better the chance of escape. Moreover, to ensure the maintenance of an adequate food and water supply for the group, the territory has to be sufficiently small to be adequately protected from other groups. It may be suggested, therefore, that the Australopithecine bands, which were naturally adapted to drier open country where game was plentiful rather than to closed bush, may have had a range somewhere between the herbivores and carnivores. They probably ranged between several sleeping places, depending upon the number of water holes, but may not have moved much farther than four or five miles from their water supply.

Comparison of male and female crania from Swartkrans (Broom and Robinson 1952; Robinson 1958) demonstrates that *Paranthropus* had already undergone selective differentiation which showed that the male must have been the stronger and so the dominant partner. "A basic function of male dominance in a primate social system may well be protection—both from predators and from territorial encroachment by an adjoining group" (DeVore MS). Especially is this true where ground-dwelling primates are concerned, and it would seem probable, therefore, that the adult male Australopithecines were primarily responsible, in addition to their hunting duties, for the defence of the band, for keeping the peace among its members, and for protecting the weaker individuals.

The responsibility of protecting the Australopithecine juveniles is emphasized by Dart's (1948) and Robinson's (1956) studies of the deciduous dentition, which shows that the young were dependent upon their parents for nutrition and protection for several years, as are human young.

It may be suggested that, like the gorilla, the Australopithecines may, when threatened by danger, have relied for protection upon making a great deal of noise —upon simulated ferocity and aggressive gestures. Since there is no indication that the Australopithecines knew the use of fire, they must have been especially vulnerable at night, so that, like baboons, they may have used trees or naturally protected rock ledges or fissures as sleeping places (Oakley [15]☆).

MIDDLE PLEISTOCENE AND THE CHELLES-ACHEUL INDUSTRIES

When we come to the main part of the Earlier Stone Age (the Chelles-Acheul Culture), many more sites are known, especially of Acheulian age. The population must still have been extremely sparse and, from the distribution as known, was confined generally to open-country grassland and park savannah where lakes, broad river valleys, or the seashore made mobility easy and provided an abundance of water and of both animal and vegetable foods.[12] Caves do not appear to have been occupied as living quarters in Africa before the end of Acheulian times; at least no evidence exists for earlier occupation of this kind.

These Earlier Stone Age people were unspecialised hunter-gatherers, adjusted more or less to one type of environment that supplied their simple needs. Since there seems to have been little permanent change in type of environment throughout the length of the Middle Pleistocene, it is not surprising that there was only extremely slow development of culture.[13] At that time, man's exploitation of his environment was still very limited, and he had no sufficiently advanced technical equipment to allow him to occupy less favourable regions such as desert or forest.[14] Probably, however, owing to the sparseness of the population, this was not necessary.

The "*Australopithecus* phase" of hominid evolution gave place during the Middle Pleistocene to a "*Pithecanthropus* phase" (Le Gros Clark 1958; Washburn 1959, etc.). The human fossil remains found in association with tools of the Chelles-Acheul culture in Africa are regrettably fragmentary or incomplete and appear to conflict, i.e., *Pithecanthropus*-type jaws with a late Chellian/early Acheulian industry at Ternifine (Arambourg 1955) and *sapiens*-type calvaria with primitive handaxes at Kanjera (Leakey 1935). This apparent anomaly disappears, however, if it is accepted that the cranial form of the Pithecanthropoid stock in Africa underwent a fairly rapid development towards the early *Homo sapiens* form, though still preserving the robust facial features of the parent stock (Wells 1957). Whether this be so or not, the increased cranial capacity of man during the "*Pithecanthropus* phase" (900–1100 cc.) over the Australopithecines (450–550 cc.) (Washburn 1959) must nevertheless represent an improved intellectual capacity brought about, it is to be supposed, as a result

[12] The faunal remains on most of these Earlier Stone Age sites are of primarily parkland, or open-savannah, rather than forest or closed-woodland forms (see Arambourg 1955; Balout 1955; Leakey 1951, 1958, etc.; H. B. S. Cooke 1949, etc.).

[13] The so-called Kamasian/Kanjeran "interpluvial" or "non-pluvial" does not appear to have been as arid as has been previously suggested; whatever the degree of climatic change, however, it was nevertheless sufficient to bring about an extinction of certain genera and species in the mammalian fauna, and the change from Chellian to Acheulian culture. (See Leakey 1951 for particulars of significant faunal differences between Beds I and II [Kamasian] and Beds III and IV [Kanjeran at Olduvai].)

[14] The writer knows of no good evidence to show permanent occupation of what is now desert or moist forest country during Earlier Stone Age times, and it may be inferred that the climate pertaining usually to those regions during the Lower and Middle Pleistocene was not sufficiently different from what it is today to make them attractive for human occupation at that level of culture. Though, at periods when the climate permitted, such country might be temporarily occupied, there is nevertheless an almost total absence of cultural remains earlier than later Acheulian times in the Horn and in South West Africa; and, for example, the eastern Katanga was only temporarily occupied by pre-Chelles-Acheul man during the Lower Pleistocene dry period; the next and permanent occupation in the Katanga took place in final Acheulian times. (See Kamoa, etc. [Mortelmans 1957*a*].)

of tool making (see Oakley [14]☆). It is reasonable to suggest, therefore, that Chelles-Acheul man was generally more effectively organised than were the Australopithecines.

The living sites of Chelles-Acheul times are invariably found close to water and often adjacent to a good source of raw material for making stone tools. The Chelles-Acheul, in particular the Acheulian camping floors, cover a larger area than those of the pebble-tool makers. The concentration of tools is generally heavier, and the patches or "squatting-places" are larger and may cover as much as 2,500 square feet or more (approximate estimate for Kalambo Falls Acheulian). Sometimes several of these patches exist at one horizon (i.e., Olorgesailie, Olduvai, Isimila, Kalambo, etc.) and may indicate either that several groups or bands had come together temporarily, or that they represent several seasons' occupation by the same band. Camping places seem to have had no particular defined limits,[15] and the concentration and scatter-pattern of tools and equipment on them give almost no indication that even the flimsiest of dwelling structures was known.[16] The absence of any appreciable thickness to most of the floors indicates that the sites were only temporary camps in the seasonal movement round the hunting territory. If they had been occupied uninterruptedly for any length of time, some depth of deposit would be bound to have accumulated, in spite of the quicker dispersal of occupation debris that can be expected at open sites where there are no natural confines such as in a cave.[17]

FIG. 3. The rough arc of stones (possibly the base of some structure) on Acheulian Floor 5, Kalambo Falls: Site B2 (1959)—partially excavated. Artefacts and waste outside the arc have been lifted; those found inside remain *in situ*. Note the somewhat later Acheulian floor with tools seen in the section of current bedded sands and fine gravels of early Upper Pleistocene age overlying the arc.

Some of these sites can have been no more than stopping places for consuming a single large food animal (Leakey 1951). Others, however, provide signs of deliberate and more prolonged occupation and are believed to represent butchery sites where a number of animals, on more than one occasion, were killed, cut up, and eaten, or where a seasonal crop of vegetable foods determined a stay of several days. The driving of game into water or swamps was practised, and there is some slight evidence to suggest that man may have carried some of the meat away with him to other camps.[18]

[15] Howell☆ has stated he thinks " 'camping places' do show limits (cf. Isimila, Kariandusi, Olorgesailie, Olduvai Bed II sites), and scatter patterns show much special activity going on." Of course the concentrations of tools and waste on these "living floors" have general limits which presumably show the general extent of the "occupation," but no consistent pattern has so far emerged to show that these camps or halting places were made on any regular plan. So far as can be deduced from the existing evidence, the scatter of the stone equipment never follows any regular pattern and is dictated solely by the circumstances of the site at the time it was occupied and by the number of individuals in the band.

[16] The only evidence known to the writer that man at this time may have used some kind of primitive shelter comes from Olorgesailie and Kalambo Falls. One or two irregular shallow depressions on one of the living floors in the Olorgesailie lake deposits in the Magadi section of the Gregory (Kenya) Rift might conceivably have been sleeping places and would come well within the range for Bushman or Hottentot sleeping "forms." At Kalambo Falls in 1959, on one of the late Acheulian living floors (Floor 5), a rough arc of stones was found which looks as if the stones had been intentionally placed there. Cultural material was found in quantity outside the arc, but very little occurred within it. It might be suggested, therefore, that these stones may have formed the base of a windbreak or screen erected to afford protection at a time when the climate was wetter and colder than it is today (Bakker and Clark 1960). In addition, these excavations yielded, on the same floor, three separate accumulations of matted grass stems, fibrous roots and twigs, all carbonised presumably due to fire. These filled shallow depressions, three to four feet in greatest diameter, call to mind the grass-lined bedding places made by Bushmen and other hunting-collecting peoples.

[17] No evidence of any long continued occupation of an Earlier Stone Age site in Africa is known to the writer before the end of Acheulian times. Some sites were consistently revisited though, and here several living floors may be found separated by thin layers of sterile deposit. However, the absence of any thickness of accumulation of occupation debris on the living floors themselves suggests very temporary seasonal occupation only—probably for no longer than was necessary for man's continued hunting to scare away the game. Malan [12]☆ has suggested that it is unlikely any considerable depth of occupation deposit could develop on an open site unless it is confined by topographical circumstances. While admitting that some outward dispersal of occupation material must take place where there has been continuous or interrupted occupation over a sufficient length of time, a vertical accumulation of debitage (waste materials) does result (shell mounds, cave sites, etc.); and, as we well know, Pleistocene living sites in the open, where fauna, both mammalian and molluscan, are well preserved, exist in both East and South Africa and under conditions where some compacting of the deposits might have been expected, though not sufficient to completely destroy any thickness of living floor, if it had existed. Caves and similar topographically restricted sites were, after the discovery of firemaking, regularly occupied, though intermittently, in the seasonal movement round the hunting territory. As a result, occupation debris accumulated at such regular stopping places (approximately 30 feet during final Acheulian / Fauresmith times in the Cave of Hearths). The fact that similar accumulations are not found at any sealed occupation sites in the open known to the writer serves to emphasise the very temporary nature of at least the Lower and Middle Pleistocene living floors, and, where topography placed no restriction on the choice of site, we can best see the transitory nature of this occupation. Some apparently favoured stopping places (cf. Olorgesailie, Kalambo, and Isimila), where several such living floors are superimposed but separated by thin layers of lake sediments, emphasise the seasonal nature of this occupation still further.

[18] See Leakey's description (1958) of the early Chellian butchery site (BK 2) at the junction of Beds I and II at the Olduvai Gorge; Power's (1946) Acheulian site at Pniel on the Vaal River; Cornelia (Oakley 1954) with a Fauresmith industry, in the northern Orange Free State; Hopefield, again with Fauresmith, in the western Cape (where concentrations of broken bones of *several* different mammals may owe their accumulation to man) (Singer 1957), and Summers [17].☆ for evidence, with the Acheulian again, from Southern Rhodesia; also, the possible driving of game through selected defiles and gaps in mountain ranges or hilly ridges as during final Acheulian and Fauresmith times at Wonderboompoort near Pretoria (Mason 1957). The discovery, in one of the lower horizons at Isimila, of a hippo carcase associated with a few

Although no regular pattern to the camping places can be seen at this time, the distribution of stone equipment and waste on some of these sites clearly indicates that different activities were being carried on in different parts of the camp. Most of the evidence on this is not yet published (Isimila, Hangklip, Olorgesailie, Kariandusi, etc.), but it can be clearly demonstrated from our own work at Kalambo Falls. In some places on the Acheulian floors at this site, only the coarse factory debris is found, together with unfinished tools or roughouts. In this instance the factory debris lay close to the source of quartzite boulders, and it could be seen how the boulders had been smashed up with considerable force by using others of similar size and weight. Large and small primary flakes lie about in profusion, and it is possible to fit not a few of these together again. It has been suggested that, at Hangklip, fire may have been used to split large sandstone and quartzite boulders, but the heat spalls on this site could be simply the result of ancient or modern bush fires. In other places at Kalambo were found concentrations (sometimes as many as twenty-five tools to a five-foot square) of handaxes and cleavers which had clearly been carried to the spot and used there. Here the waste is confined to typical "handaxe trimming flakes," which occur in some quantity and which could be flakes knocked off either during use or by intentional resharpening. The latter explanation is preferred, but the detailed study of the material has not yet been completed. In other places, again, isolated implements, or one or more handaxes or cleavers together, with several feet separating them from the next group, suggests that they may have been the tools of single individuals. Handaxes and cleavers have also been found standing on edge in the sand of the camp floor, which suggests that they may have been placed like that when the individual had finished using them (at Isimila—personal communication from M. R. Kleindienst—and Kalambo Falls, 1959 season). In other places, notably on the bank and down the side of a stream channel at Kalambo, were a large number of flake tools. These again suggest that some specialist activity may have taken place there. For possible explanations of the Middle Pleistocene flake industries see Posnansky (1959*a*) and Clark (1960).

The only formal tools of this time were the handaxe and cleaver, but numerous unspecialised flake tools were also used, as well as pounding and chopping equipment.[19] The preponderance of large beasts[20] at many of the sites, and the nature of their remains, indicate that the equipment was fully adequate for the dismembering of even the largest animals and made it possible for every part that was in any way edible to be consumed. Good circumstantial evidence[21] can be adduced to suggest that one of the main uses for the handaxes and cleavers, that occur in such profusion on the sites of this time, was as meat mattocks and flensers for dealing with thick-skinned, larger game.

There is every reason to believe that the stone equipment of Earlier Stone Age man was highly expendable and that, provided the raw material was available (as it usually was), tools were made for a particular occasion only and were subsequently discarded when the band moved on. The nature of his subsistence required that man be fully mobile, and it is unreasonable to suppose that large quantities of stone tools were carried about when man's technical ability enabled him easily to manufacture new tools. But if these and many of the smaller flake tools were domestic equipment, is it possible to determine what weapons these people possessed?

artefacts, but from which the limbs and skull were missing, may perhaps be interpreted as a beast killed or scavenged by Acheulian man who would thus have been responsible for removing the missing parts. I am much indebted to Howell for this information and for making it possible for me to visit this site. See also in this connection the selective nature of the fauna in the Australopithecine deposit in the Transvaal caves.

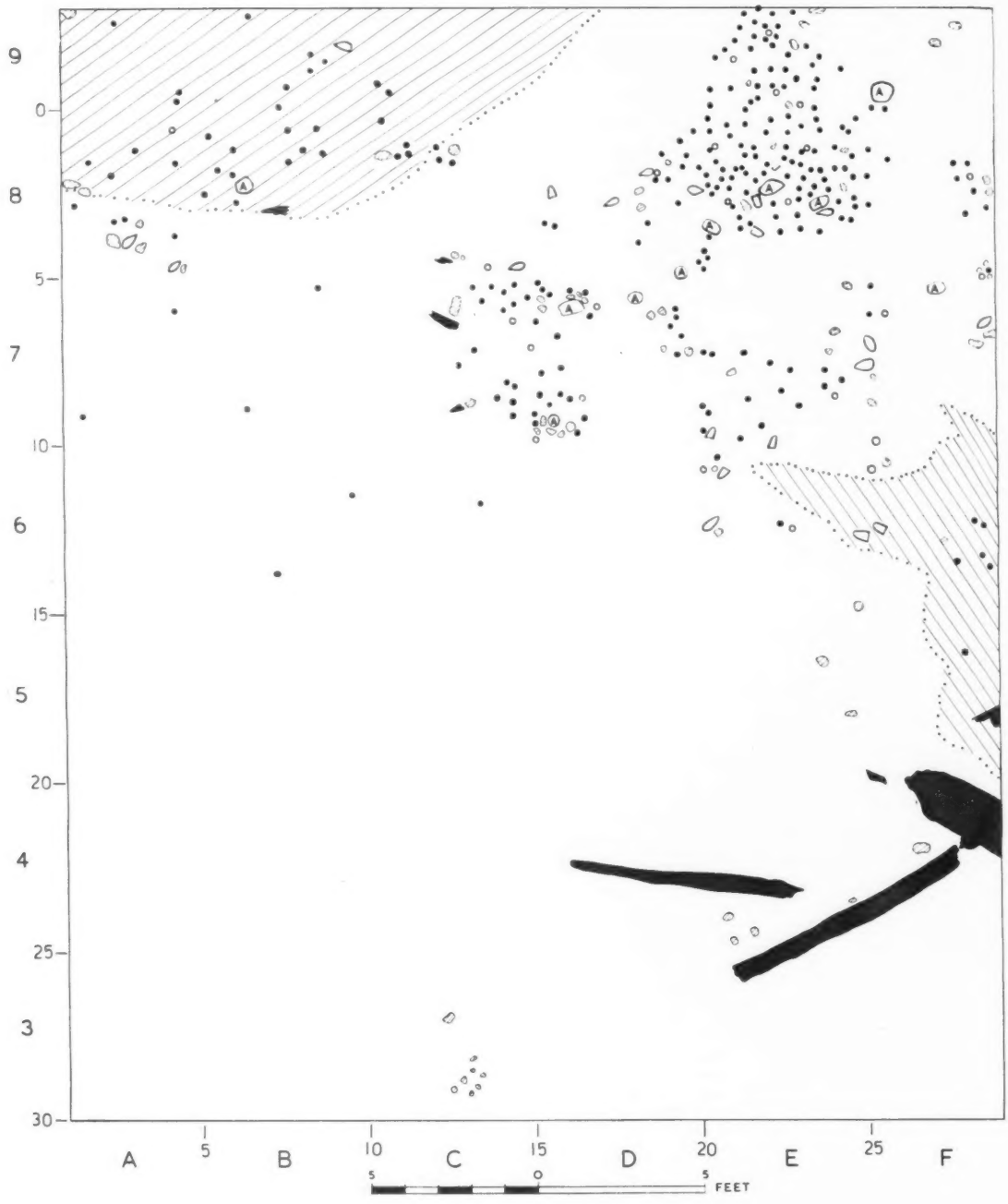
[19] Howell [8] has suggested that there are a number of formal tools present in the culture assemblages at this time. I cannot agree that the flake tools, polyhedral stones, and choppers, etc., were formal tools in the sense that the handaxe and cleaver are. These latter tools were made to an intentional pattern or shape, and although the forms varied both regionally (see footnote 6) and in time, they were nevertheless made to conform to certain definite shapes which it must be considered represent the contemporary preferences of the individuals who made them. Thus Leakey (1951) was able to subdivide the stratified Chelles-Acheul culture at Olduvai on the basis of characteristic handaxe and cleaver forms. Van Riet Lowe (Söhnge, Visser, and Lowe 1937) has done the same for the Vaal River basin, and so on. Examination of considerable quantities of other tools and factory waste from widely separated sites has convinced the writer that the same intentional design of form does not lie behind the flake tools and other stone equipment of Middle Pleistocene man. It is true that it is perfectly possible to sub-divide flake tools, or choppers, for example, into many different forms—single and double side-scrapers, hollow scrapers, points, and so on—but a careful examination of the working edges indicates that the final shape of the tool can have been of little or no importance. It is not possible to show, for example, from the assemblages I have examined, that there was any special selection of forms of primary flake for the manufacture of special categories of flake tool. Any convenient flake or core seems to have been used. Edges show some secondary trimming and a lot of trimming resulting from utilisation, and it would seem to have been of no special importance whether one or both edges were used, or whether, in the latter case, the edges sometimes converged to a point, or not. The amount of "secondary working" seems to have depended on how much work had to be done with the tool, what it was used for, and whether the shape of the primary flake prevented more than one edge from being used. The same applies to choppers, chopping tools, and other core tools. Polyhedral stones would seem to have acquired their shape in the earlier stages as a result of utilisation (as hammer stones, anvils, nut and bone crackers, etc.), rather than by deliberate intention. No consistent design is apparent. But by the very end of Acheulian times these stones were being made into well-shaped spheres, and, it can be argued, had by then been adapted to some secondary use; they had thus become formal tools in the sense that handaxes and cleavers are so described here.

[20] Fauna lists from Ternifine (with a late Chellian/early Acheulian industry) include (Arambourg 1955, 1957): *Elephas atlanticus, Rhinoceros simus, Camelus Thomasi, Hippopotamus, Giraffa*, large and small antelopes and gazelles, *Machairodus*, giant pig (*?Afrochoerus*), giant baboon (*?Dinopithecus*). From the BK 2 (Chellian I) site at Olduvai (Leakey 1958) came: *Rhinoceros* sp., *Serengetitherium* sp., giant pigs, *Palaeoloxodon antiquus, Archidiskodon* sp., *Pelorovis olduvaiensis, Bularchus arok, Hippopotamus gorgops, Giraffa capensis, Sivatherium olduvaiensis, Equus olduvaiensis*, etc. At Elandsfontein (Hopefield) the larger animals included (Singer 1957): *Palaeoloxodon antiquus*, White and Black Rhinoceros, *Equus helmei* (cf. *E. capensis*), giant pigs, *Hippopotamus, Sivatherium olduvaiensis, Homoioceras* sp., and large antelopes. The culture associated with the Elandsfontein fauna is believed to be a regional Fauresmith.

[21] On living sites that have not been disturbed and where tools are fresh, it is apparent that the edges of handaxes and cleavers are always sharp, though blunting may result from differential battering of some parts during manufacture or re-trimming. This implies that these tools must have been used on "*soft*" rather than "*hard*" substances, as, if employed for chopping wood, for example, they would show shattering and blunting of the edges, which they do not. Some form of large cutting tools would be essential to dismember most large animals, as is apparent when one observes present-day Africans cutting up an elephant or hippo: machetes, axes, and knives are all employed. As has been demon-

KALAMBO FALLS : SITE A1 (1956)

FLOOR 4 : ACHEULIAN



KEY

- Handaxe
- Cleaver
- Flake and Flake-tools
- Core and Core-tools
- Anvil
- Natural Stone
- Wood

From contemporary sites in Europe we know that Middle Pleistocene man had wooden spears, and there is a suggestion from one of the African sites that they may have possessed the throwing stick or club.[22] When one adds to these the use of natural and artificially shaped stones as hand missiles, it is likely that the somewhat meagre inventory is virtually complete. Indeed, the Australian aborigine possesses little more than this even today. The emphasis in securing the meat supply must have been on mobility and co-operative hunting, the method best suited to the environment favoured by the Earlier Stone Age people.

Fish was sometimes collected and eaten, for fish-remains (*Barbus* and *Protopterus*) have been reported from a Late Acheulian living floor (Nyabusoro: M/N horizon) in the Kagera Valley in Uganda (Posnansky 1959*b*). Also, the irregular line of stones partially excavated on one of the temporary land surfaces round the one time Lake Olorgesailie in the Magadi section of the Kenya Rift is reminiscent of the small fish weirs and dams commonly built in tropical Africa round the margins of lakes and rivers where fish can be trapped as the water recedes at the end of the rainy season.

It is reasonable to suppose that there were no members of the band who were not engaged in collecting food, and, especially for hunting, there must have been some means of controlling behaviour and ensuring co-operation among the individual members. Even at this early stage co-operative effort would have been essential, and from this Sommerfelt assumes that some sort of language is as old as man himself, and developed with the tool (see J. G. D. Clark [5]☆ and Sommerfelt 1954). Such basic language would not have been speech, as we know it, and must have been very limited in its field of reference and probably confined to various inarticulate cries, signals, and gestures, though less limited and more fluid than that of other higher mammals.

Wild vegetables must have been also an important source of food, but to obtain these, little equipment would be necessary other than a digging stick and a sharp stone, and such sticks have been found at one African site (Kalambo Falls). The fruits and shoots best found in the fringing forests along the water courses can be collected with little more than a chopper to aid in tree

FIG. 4 *at left* and FIG. 5 *above*. Plans of parts of two Acheulian camp floors at Kalambo Falls, showing scatter patterns of tools and waste.

strated more than once, a handaxe or a cleaver would have formed a serviceable tool for skinning and dismembering a kill and for cutting up or scraping the meat off bones.

[22] Cf. the wooden spearpoint from Clacton-on-Sea associated with the typical Clactonian industry in the Elephant Bed (of Great Interglacial age) and a complete spear associated with an elephant and Levalloisian industry at Lehringen, near Bremen, Germany (of Last Interglacial age). Fragments of worked wood that may have formed part of a throwing-stick and a short club-like piece were found with a late Acheulian industry at the Kalambo Falls, Northern Rhodesia, during 1956 and 1959.

climbing and a natural container to hold or store the food. Honey may have provided the necessary sugar, and deficiencies in mineral salts could be supplied by some lake or river silts.[23] Thus we may presume a reasonably balanced diet for these people.

As to the size of bands during the Earlier Stone Age, there is little that can at present be said with certainty. A study of the number and variety of implements in relation to the number of food animals on the camping sites might be expected to give an approximate estimate. There is, however, no evidence of even semipermanent occupation of a camp site during the whole of this period, and the composition of bands can, therefore, never have been very large. Before the spread of firemaking it is likely that man continued to rely for defence on numbers and group action, as do baboon troops, so that with his improved efficiency in tool making and foraging it may be supposed that Chelles-Acheul man was grouped into larger units than were the Australopithecines. The groups would still have been small enough to preserve the degree of mobility necessary, though it may be surmised that at favourable seasons, or for specific purposes, larger units would have come together (see Howell [9]☆).

The discovery of how to make and use fire apparently did not reach Africa until the end of the Earlier Stone Age, no doubt on account of the prevailing climate which was warmer than in Europe or North East Asia (Oakley 1955) where the first evidence for man's use of fire goes back to the Mindel Glaciation (Choukoutien). The social and economic advantages attendant upon this revolutionary discovery must, therefore, be considered to have been largely unexploited in Africa during the 400,000 years or so of the Earlier Stone Age.

The earliest evidence of fire in Africa is found at the very end of this period. At approximately the same time, evidence for the occupation of cave sites begins,[24] and regions that are now moist rain-forest and desert country began also to be occupied on a more permanent basis. The ability to specialise by adaptation now enabled man to establish himself in most areas, and there is a considerably more continent-wide distribution of sites. Both these circumstances—the occupation of caves, providing shelter and protection and a semipermanent home, and the population of hitherto less attractive environments—were, it may be suggested, indirectly due to the use of fire.

The working of wood (Clark 1955, 1959*a*) must have been greatly facilitated by the use of fire, and easy woodworking, in turn, provided new methods of hunting. The felling of trees can now have presented no great difficulty,[25] and the use of various kinds of traps in more thickly wooded country may have given rise to more individual forms of food collecting. Thus members of a group were enabled to live in less close contact, and groups could develop independently. The greatly increased number of sites known from the times of the First Intermediate and Middle Stone Age cultures may be taken to indicate also an increase in overall population. The greater need for, and, it may be suggested, the more jealously guarded rights over, permanent water resources may have led to interband warfare.[26]

UPPER PLEISTOCENE: MIDDLE STONE AGE INDUSTRIES

If the desiccation[27] which brought the Earlier Stone Age cultures to an end saw the beginnings of regional specialisation in technical equipment, and so, we may infer, in society and culture, the Middle Stone Age, extending in time throughout much of the last or Gamblian Pluvial,[28] saw specialisation carried further and the establishment of a number of regional[29] cultural

[23] There is reason to believe that some of the lumps of peaty clays with burnt vegetable matter that have been found on Late Acheulian camping floors at the Kalambo Falls may be pieces of lake muds purposely collected for eating. Geophagy as practised in Africa today is normally related to mineral-salt or vitamin deficiency.

[24] Open sites with evidence of fire are a late Acheulian floor in the Kagera valley (Nyabusoro), where Posnansky reports burnt bone; and the Kalambo Falls, where charcoals, ash, and charred logs are preserved with the late Acheulian. Cave sites yielding similar evidence are the Cave of Hearths in the northern Transvaal and the Montagu Cave in the western Cape.

[25] Deciduous trees are regularly felled by lighting a fire at the base. African hoe cultivators, when clearing new bush for planting, fell large trees by lighting a fire at the base of the trunk.

[26] It is of interest to note in this connection the cast of the wooden spear in the head of the femur and pelvis of one of the Skhūl burials (Skhūl IX) at Mount Carmel, Palestine, the circular wound penetrating the temporal bone of Broken Hill Man (*Homo rhodesiensis*), and the circular depressed fractures on the frontal of the Florisbad skull.

[27] Good evidence for drier climatic conditions at this time is available from southern Africa—notably in the valley of the Vaal where calcareous and windblown sands choked the main river and overlie the latest Acheulian industries. At the Florisbad mineral spring, the vegetation of this time shows that the water was brackish and a saltmarsh flora predominated. In northeastern Angola and on the Zambezi, there was also much redistribution of sand by wind and surface wash. Sangoan tools are incorporated in the lowest levels, while earlier Middle Stone Age tools are interstratified in the main body of these redistributed sands.

[28] Evidence for the existence of this "pluvial" in the type area of East Africa has been summarised by Flint (1959*a*). Based mainly on strandlines representing fluctuating lake levels in closed basins, it has been shown by Leakey, Nilsson, and others that the lakes of the Naivasha–Nakuru basins were, at times during the later Pleistocene, considerably deeper and more extensive than they are today. Flint indicates that the extent of such fluctuation can, with probability, be traced along the Rift Valley into Tanganyika in the south, northwards into northern Kenya, and westwards into the Lake Victoria basin. Well-preserved strandlines also exist in closed lake basins in southern Tanganyika, though they have not been examined systematically as yet for artefacts and fossil fauna. Weathering profiles, the formation of laterites and ferricretes, and sedimentation in river valleys have been interpreted as representing oscillating and humid climates by De Heinzelin (De Heinzelin 1952, 1959) in the Congo Basin, and by a number of other workers, already cited, for southern Africa. Evidence for a general lowering of temperature during the Gamblian can be adduced from the former extent of glaciers on Ruwenzori (De Heinzelin 1959) and Mount Kenya (Nilsson 1940), from fossil pollens of *Podocarpus* and *Ericaceae* in significant percentages at Kalambo Falls and Mufo, and from a reassessment of the upper part of the Florisbad pollen diagram, which is now considered to compare with high montane grassland (Bakker and Clark 1960).

[29] Howell☆ points out that regional adaptation of culture is largely inferred and draws attention to the need for absolute data on the ecology of particular areas in which the different industrial variants are found. Such need cannot be overemphasized, and it must be realised also that only teamwork will produce this data. Upper Pleistocene vegetation patterns are inferred from faunal, botanical, and pedological evidence. Faunal lists from archaeological sites, present-day disrupted distribution of fauna and flora, and soil studies have up to now provided the most acceptable indications of palaeo-climates, but recent botanical work at "wet" sites is showing that fossil pollens are perfectly well preserved under certain conditions and may be expected to give the best evidence. Pollen analysis is beginning to confirm that changes in vegetation patterns under "pluvial" and "non-pluvial"

variants (Malan 1949; Clark 1959*a*). These demonstrate the extent to which their makers were able to exploit local ecological resources, in that we find some variants adapted to moist rain-forest, others to savannah, others to grassland, and so on. For example, in the Lupemban and later Sangoan variants there was a great emphasis on woodworking tools and equipment, suited to close bush in the thicker vegetation areas, and, perhaps, one may suggest for such cultures a heavy dependence on vegetable foods.[30] In this connection should be noted the grinding and pounding stones found with Middle Stone Age cultures in the savannah regions, and there honey may also have been easier to obtain if the state of the teeth of Broken Hill man is anything to go on. In other cultures hunting would seem to have assumed the greater significance, and the pressure-flaked points of the Pietersburg and Stillbay peoples, for example, show the importance of throwing spears and knives in the equipment of a band of hunters.

Now, for the first time, we have slight but definite evidence of the differing nature of wet- and dry-season camps.[31] The wet-season camps of hunter-collectors may be expected to be some distance from permanent water and the stone culture to reflect only transitory occupation by a band or small group of hunters without the full range of tools found at the more permanent occupation sites. (For Bushman wet-season camps, see Schapera 1930.) Alternating residence in semi-permanent camps, protected by fires, must have resulted in more specialised food collecting, according to season, and perhaps also in a more exact division of labour between the sexes. Certainly a greater specialisation in activities seems to have accompanied the increased use made of materials other than wood and stone.[32] Perhaps the percentage differences in tool form within a single site, and the variation in the percentages over groups of sites, may serve to distinguish equipment used primarily by men and that used primarily by women.

From his increased tool-making ability, it can be assumed that Middle Stone Age man's intellect had developed considerably beyond that of his predecessors, and the fossil record shows that, by the later half of this period, *Homo sapiens* had replaced the palaeoanthropic stock. There is indirect evidence that the social structure was more complex than in Earlier Stone Age times and that man was able to communicate ideas to his fellows in a way that is possible only by the aid of true speech. The development of specialised tools, the invention and spread of hafting,[33] the use of pigment presupposing art,[34] burial of the dead, and the closely similar pattern of industries, within circumscribed ecological regions, favour cohesion of groups that could have been supported only by a common tongue for each.

It might not be over-stretching the evidence, therefore, to suggest that loose tribal groupings were already present in Middle Stone Age times and that, with improved technical ability permitting greater exploitation of the resources of the environment, there was an overall increase in the size of the hunting bands. Presumably the same factors governing the relationship between rainfall intensity, natural resources, tribal area, and population density that are applicable to modern primitive groups apply also to prehistoric cultures (Birdsell 1953, 1957). But as yet we have only the most imperfect knowledge of the ecological background of these cultures in Africa, so that any attempt at estimating population density or the sizes of bands can be only guesswork.

conditions did not bring about the total extinction of genera and species of one pattern and its supercession by another, but were manifested rather in advances, or wider dispersal, of some forms and retreats, or contractions, of others. For example, the pollen spectra from Florisbad, Kalambo Falls, Mufo, and other sites in southern Africa (Bakker 1957; Bakker and Clark 1960) and from the Sahara (Bakker 1958) indicate that, since the beginning of the Upper Pleistocene, changes in precipitation and temperature have been sufficient to turn sour veldt into sweet-grass veld, saline to freshwater conditions in small lakes and pans, and to bring the montane cold-loving flora as much as 1,000 to 1,500 feet below its normal habitat. It was not sufficient, however, to cover the Free State with savannah, nor the Tanganyika Plateau with closed forest, and, while the cold-loving vegetation was able to spread over the higher parts of the central plateau, this repopulation can never have been more than of a corridor or gallery nature. Goodwin (1955) was one of the first to show that the modifications in the climate of Africa during the Pleistocene were not of the severity archaeologists have been used to suppose. Thus, generally speaking, archaeologists should think in terms of shifting belts of vegetation, of changes in accordance with a regular pattern where, if the precipitation is increased, desert is replaced by sclerophytic steppe, steppe by park and woodland savannah, savannah by various kinds of forest; or if the rainfall becomes less, a reversal of this pattern can be expected. Given, therefore, the existing vegetation pattern, and some knowledge of the magnitude of changes in precipitation and temperature from pedological evidence, it should be possible to reach an approximate idea of the pattern for the various regions at the peak of a wet, and lower level of a dry, period during later Pleistocene times, and to confirm this by future palaeo-botanical investigation. Some attempts have been made already to reconstruct vegetation patterns in certain regions during non-pluvial and last pluvial times (Butzer 1958; H. Wild, in Clark 1957; Clark 1959*a*), and more palaeogeographical work of this kind is urgently required.

[30] It is my belief that the heavier woodworking element in forest country implies, amongst other practices, a greater dependence on, or greater use of, vegetable foods. But, see Howell [10].☆

[31] A typical wet-season temporary hunting camp has been described from northern Bechuanaland (Bond and Summers 1954). Compare this with the equipment from cave sites such as Bambata, Mumbwa, Cave of Hearths, or Border Cave.

[32] As we have seen, bone as a raw material for tools was used from the time of the earliest tool makers, but it is not until later Pleistocene times that we find bone specially worked to intentional shapes. Some of the earliest evidence from southern Africa comes from the Broken Hill cave, where gouges, spatulate- and pointed-ended tools in bone occur, in addition to various utilised fragments (Clark *et al.* 1950). The utilised flake of hippo ivory, which bears a well-marked bulb of percussion, from the Chellian II living site (SHK II) at Olduvai Gorge (Leakey 1958), although it is made of ivory, cannot be classified as an intentionally shaped ivory tool in the sense employed here, since its maker has employed stone technique suggesting only fortuitous use of ivory as his raw material.

[33] The reduction of the bulb and striking platform that can be seen on flakes and flake-blades in significant percentage on sites of the middle and later stages of the Middle Stone Age can probably be interpreted as aids to facilitate hafting. A Carbon-14 date of between 27,000 and 29,000 years B.P. for a Rhodesian Lupemban industry at the Kalambo Falls, where such reduction of butts can be clearly seen, suggests that the introduction of hafting may have first spread generally within the sub-continent at some time shortly after 30,000 years B.P.

[34] Pigment with rubbed facets has been discovered in association with a few earlier Middle Stone Age industries, e.g., Bambata, Twin Rivers, and Broken Hill, and with a number of later Middle Stone Age industries. As Howell☆ points out, two pieces of red ochre were found on the Chellian living floor (BK2) at the base of Bed II at Olduvai (Leakey 1958). These pieces bear no signs of use by man, though Leakey suggests that they were intentionally brought to the site. They may have reached their position through the same agency that distributed the large numbers of natural pebbles and lumps of rock over the floor—through a natural, or possibly human, cause.

POST-PLEISTOCENE AND LATER STONE AGE INDUSTRIES

Somewhat more evidence is available for Later Stone Age time, however. These people were still in a hunter-gatherer stage of culture, but geared, one may suggest, more closely to that preserved in existing Bushman social structure. In some instances the recognition of wet- and dry-season camps, besides affording indication of specialised activity, has produced some idea of the size of the smallest groupings. Small dry-season camping places of the Wilton peoples in the Zambezi Valley are characterized by not more than two or three windbreaks along the river which show that, in this region of open forest on Kalahari sand, bands seem to have split up when the dry season was well advanced and converged in small groups on the banks of permanent water just as the Bushmen still do today (Bond and Clark 1954). In other areas, however, it seems that the dry-season concentration by the side of permanent water was an occasion for people to come together in larger groups. This latter form of grouping may possibly be connected with some specialised activity such as fishing (a supposition based on the high incidence of a particular tool form), and may be expected to have occurred at the end of the rains when the water in the rivers was just beginning to recede.[35]

Again, the specialised Ishango culture, with its range of bone harpoon types, found in the terrace silts and gravels of a former higher level of Lake Edward, could represent the fishing equipment of people who lived seasonally on off-shore papyrus sudd islands, as is done by some Nilotic and Negroid groups today (De Heinzelin 1957).[36] There is also evidence that specially favourable ecological conditions may have permitted more or less all-year-round occupation of an area by some groups. The strandlooping peoples living along the South African south and east coasts are a probable instance.[37] They lived permanently upon sea foods, though they still retained their mobility to some degree. The groups that specialised in hunting the eland in the eastern Free State and Natal are another instance of more specialised food collecting.

Estimates of band size are sometimes permissible from the evidence of foundations of windbreaks (Clark 1959*a*: 218–19), and approximate estimates of territorial limits, based on the distance of culturally related sites from the nearest permanent water, indicate that hunting territory in the drier parts of the continent was more extensive than that of bands that occupied ecologically more favourable regions (Goodwin 1936). Some indication of the spatial range of a group is given sometimes by rock paintings, e.g., of fishing scenes and marine animals believed to have been done by the same hand, and two such paintings are over one hundred miles apart and each about one hundred miles from the sea (Goodwin 1949). Again, seashells have been found on inland sites at even greater distances from the sea. That widely separated bands could come into contact, perhaps for barter, is shown by the presence of obsidian from the Rift Valley as far east as Mombasa, and carnelian and agate beads of specialised form from widely separated Later Stone Age sites in East Africa and even in the Sudan (Cole 1954: 238–40).

That the activities of these Later Stone Age, and even older, groups may have had some measure of effect upon their environment is not impossible, but, where there is no permanence of settlement, such effect must always remain difficult to estimate. However, it is not impossible that the retreat and restriction of the moist rain-forest and the re-distribution of wind-blown sands of Kalahari type were assisted by the deliberate burning of the bush in game drives or to promote new growth.[38] Without some such human agency, it is difficult to see how the destruction of the forest in Angola and the Congo Basin could have been so complete as to remove the vegetation cover sufficiently to allow the redistribution of the sands. This frequently-exemplified phenomenon can hardly be explained on the basis of natural forces alone.

It seems likely also that the encroachment of the Guinea type of bush on the rain-forest in Equatorial Africa was, in the first instance, brought about by Later Stone Age peoples possessing, amongst other equipment, the bored stone, the polished stone axe, and grinding stones in some numbers. It can be shown that these people may have practised some form of intensive collecting or even *vegeculture*, based on the palm-oil tree and the wild yam, and perhaps on the sporadic cultivation of the latter (Schnell 1957). These more intensive collecting or *vegecultural* (Braidwood and Reed 1957) activities must have been accompanied by a more stable settlement pattern, as can be seen from the presence of pottery at many sites and the probable use in West Africa of a medium of exchange in the form of finely perforated quartz pebbles often found in hoards (Shaw 1944). Equally important changes in social relationships must also have taken place. The distribution of the larger bored stones in relation to yam and/or millet cultivation is particularly interesting, since many of these stones are thought to have been used to weight digging sticks. The collecting of vegetable foods is primarily a female occupation, and it may not be too far beyond the bounds of possibility that cultivation brought about a change in the status of women. Polygyny may have been encouraged as one way of building up a labour force, and cultivation may even have been one of the factors in the establishment of matrilineal societies.

Additional evidence as to the division of labour between the sexes is apparent from grave goods and from historical record. Grave goods also give some indication of magico-religious beliefs, for example the painted

[35] E.g., certain sites on the upper Zambezi near Livingstone, and on the middle Zambezi in the Kariba Lake area. These waterside sites show a high percentage of crescent adze-flakes which suggest some specialised activity possibly connected with fishing—perhaps the manufacture of basket traps, fish spears, or arrow shafts from *Phragmites* reeds.

[36] De Heinzelin, on extrapolated radio-carbon dating, places the Ishango culture between 6,500 and 6,000 B.C. Carbon dates for the Wilton and Nachikufan cultures in Rhodesia show that the Later Stone Age there ranged between 4,500 B.C. and 240 B.C., though of course these dates must not be considered as representing the maximum lower and upper limits.

[37] A specialised variant of Smithfield A at the Matjes River Cave has been dated by C-14 to between 9,200–8,500 B.C. approximately.

[38] For the later re-distribution of Kalahari-type sands in Angola, the Congo, and Rhodesia, see Leakey (1949), Janmart (1953), Mortelmans (1957*b*), Clark (1950).

grave stones from the south coast caves, but, in the main, for the Later Stone Age peoples it is the rock art upon which we draw. From this art we can reconstruct a picture of rain- and hunting-magic and of ceremonies associated with burial, initiation, and perhaps marriage. Even the day-to-day lives of these people is well represented in this art. Further, the rock art provides a wealth of social evidence, the extent and nature of clothing, of weapons, of domestic equipment, the various techniques of hunting, fishing, and food collecting, raw materials, records of events such as dances, fights, cattle raids, and so on, and helps to fill out the information yielded by excavation. From it we see that in South Africa generally there existed, until comparatively late times, Stone Age hunter-gathering groups living side by side with more advanced peoples whose propinquity had modified their traditional culture patterns to varying degrees.

Neolithic[39] mixed farmers in the highlands of East Africa and Abyssinia, who built some permanent settlements but still no doubt also moved to a certain degree with the seasons, seem to have been the lineal descendants of the Mesolithic hunter-gatherers there. There is also evidence that they may have been in contact with outsiders, however, on the one hand with the Nile Valley, and on the other with the sea coast. Influence from these groups or from the Horn penetrating to South West Africa probably caused some of the western Cape peoples to adopt a nomadic, pastoral life.

Generally speaking, it is not until the southward movement of the Later Iron Age peoples and the northward movement of Europeans from the Cape exerting pressure on the hunter-gathering groups and bringing about large-scale population movement in search of fresh land or new wealth, that there is evidence for anything other than amicable relationships between gatherers and producers and a slow cultural integration. Signs of this latter can be seen in the various cultural borrowings between groups and in the modification of the use of certain forms of tool. Hunter-gatherers, no doubt impressed by the greater material possessions of the settled communities, seem particularly ready to borrow from their wealthier neighbours, and African prehistory has a number of good instances of this. This process can also be well seen in Africa today, and it is interesting to note that borrowed forms are not always made to serve the purpose for which they were originally intended.

Up to the end of the Middle Pleistocene, Africa's contribution to the development of human society seems to have been as great and probably greater than that of any other continent. But, from Later Pleistocene times onwards, possibly because it lacked the environmental stimuli present in more northerly latitudes, human culture south of the Sahara seems to have received more than it gave. This situation seems to have become more pronounced in later times, so that by the time the earlier food-producing cultures appear there, the imitative rather than the inventive trend of indigenous culture is clearly evident.

It must be apparent from this brief sketch that we are still a long way from being able to reconstruct even the latest cultural levels with anything like completeness. We know not a little about the manner of manufacture and use of tools and other equipment—how, for example, microliths and thumbnail scrapers were hafted and used—but we need to go further and endeavour to interpret these in terms of the social and economic life of their makers. We have some facts established and can reasonably infer others, but if the society and economies of African prehistoric cultures are ever to be interpreted properly, we need the help of natural scientists and anthropologists to provide the ecological settings, since such is fundamental to a more complete understanding of any culture, and we need many more efficient excavations to expose and accurately record the settlement patterns—more facts and more teamwork.

[39] The term "neolithic" is used here in an economic sense of population groups that were essentially food producers. Permanent settlement and/or crop cultivation and domestic stock are prerequisites of "neolithic" culture.

Comments

By J. G. D. CLARK☆

[1] Spatial distribution: This is an excellent statement, but I suggest that the danger of publishing distribution maps prematurely, i.e., before field survey has been carried out evenly over the territory, ought to be emphasised; otherwise there is a danger of conclusions being drawn from distribution patterns which reflect no more than the contemporary state of prehistoric research.

[2] The paragraph on environment and ecological setting might be combined with the one on chronological framework, since the main basis for a chronology of the Pleistocene rests on a study of changes in the environmental and ecological setting.

[3] The point made about the necessity for teamwork is well taken. It might be mentioned that this has long been a recognised concept of Quaternary Research.

[4] Ethnographic evidence: The danger inherent in an uncritical use of such evidence should be stressed. "Existing primitive peoples" are not in a strictly historical sense primitive, or at least cannot be accepted as such unquestionably; they are, after all, living on the same plane of time as ourselves, have had an equally long history, and during the last few centuries in particular must, or at least might, have been subjected to influences emanating from cultures at many different levels. Moreover, there are usually several alternative ways of meeting the same problem, and it does not follow that the same choices were made by the prehistoric people and modern "primitives" chosen for comparison.

[5] Language: Surely language in the elementary sense in which it is defined here is common to other animals and even insects, and is it not the case that co-operation between individual members is highly developed in many animal and insect communities?

By F. CLARK HOWELL☆

[6] Considerable evidence is still necessary to establish the actual existence of these "dry periods" in certain tectonically unstable areas of eastern-central Africa. I indeed doubt that several are clearly and unequivocably recognizable in that part of the continent *on present geological evidence;* not that such did not occur, but proving them is another matter! Surely it is still

premature to consider them, as some writers (including myself) have done, as of continent-wide application, especially when neither the number nor the magnitude of presumed climatic changes are known. This is also the point of view of H. B. S. Cooke (1958) and of R. F. Flint (1959*a*, *b*). There does seem to have been a drier period (Clark's third period) prior to the Gamblian Pluvial in many southern African areas, but in more unstable regions of the continent this is hard to establish. The Isimila site in the Iringa Highlands of southern Tanganyika provides quite good evidence of a damper-drier-damper succession (the rich late Acheulian occupations occurring during the relatively drier interval), but this sort of evidence is hard to find elsewhere in this area. The evidence for the second such dry period is even more rare, including southern Africa; a number of workers, including Flint, Cooke, Pickering, and the writer, are not fully convinced that Bed III at Olduvai Gorge represents an "interpluvial" in the usual sense in which that term has been employed. The Lower Pleistocene drier period (Clark's first period) is also poorly established, especially when one considers the curve of the amount of rainfall change indicated in the Krugersdorp cave fillings (Brain 1958).

[7] I think "contemporary" regional and other variants are present in the Middle Pleistocene, i.e., Early Stone Age, hence doubt whether, *on these grounds*, this conclusion is justified.

[8] There were a number of formal tools (polyhedral stones, choppers, scrapers, etc.)—not only the handaxes and cleavers.

[9] On the question of "favourable seasons," etc.: Isimila may show this in fact; many of the differences from site to site may be merely a reflection of this factor.

[10] I would question here the "greater use" of vegetable foods. Is it not also very likely a question of different uses of a different range of vegetable foods?

By B. D. Malan☆

[11] Clark seems to place too much emphasis on wetter periods and the absence of the wheel and pack animals as restrictions on the movements of peoples and individuals, and consequently of "culture." We know that today individuals frequently travel half the length of Africa on foot in search of work, and the presumption is that Stone Age men had even better use of their legs. There is evidence in rock paintings of considerable movements of Later Stone Age artists between the coast and the interior. It is difficult to believe that ecological changes of the order postulated in Africa had any marked effect on human capacity to travel, or that the absence of the wheel and pack animals is relevant. Greater cultural movement and expansion may indeed have taken place during drier periods, but Clark seems to be clutching at straws to explain the phenomenon. Is it not possible that during wetter periods the contrast between forest and savannah environments was greater and so acted as a more effective barrier to cultural expansion and interchange? Perhaps the phenomenon depends on factors such as incompatibility of culture, lack of cultural adaptability, conservatism of tradition, or absence of pressure of population, rather than a hypothetical restriction on the physical movement of people during a wet period.

[12] Clark takes the lack of thickness of Earlier Stone Age deposits on open sites as evidence that such sites were merely temporary camps occupied for relatively short periods. Here again the conclusion is probably sound, but the argument open to question. It is difficult to see how, even during a prolonged occupation, any considerable depth of occupational deposit could develop on an open site unless the deposit was confined by some exceptional topographical circumstance such as a hollow in the ground. In other words, prolonged occupation of an Earlier Stone Age open site would lead to outward dispersion of debitage [waste materials] rather than a vertical accumulation or thickness of deposit. Only when the particular way of life demands the disposal of a considerable *volume* of waste, such as ash or shells, in the form of heaps or middens, can thick deposits be expected to develop on open and unconfined surfaces.

By K. P. Oakley☆

[13] After reading the paper I found myself attempting to assess very roughly the social structure of the early human groups in Africa at each of the main levels of culture. The result was as follows:

Earliest Hominids (Australopithecines): In size of groups and social structure they were perhaps comparable *initially* with baboons. Like baboons they were adapted to life in relatively dry open country. It has for long been inferred that their adaptation depended on developing carnivorous habits, maintained through becoming bipedal and thus having hands free for use of tools and weapons to supplement bodily equipment. We had known from field evidence such as that collected by Captain H. B. Potter (quoted in *Science News* [Penguin] 21 [1951]:77–78) that baboons are occasionally carnivorous and have been observed engaging in "apparently organized hunts." It therefore seemed highly probable that the hominids in becoming adapted to the same environment developed such habits to the full. However, it was not until this year that Raymond Dart's belief that the Australopithecines were hunters and at least tool-users was fully confirmed. From the food-debris at the living site of *"Zinjanthropus"* discovered by Mrs. L. S. B. Leakey, July, 1959, in Bed I at Olduvai, there is no longer any question that at any rate the more advanced Australopithecines were carnivorous, that they hunted small mammals and the young of medium-sized mammals, and that they were tool-makers.

From the point of view of the beginnings of culture it may be important to remember that if the earliest hominids were comparable with baboons, the numbers who were in group contact at any one time may have fluctuated as widely as between 20 and 200, depending on the scarcity or abundance of food supplies.

[14] *Middle and Upper Pleistocene men:* The increasing number of cultural elements in common with primitive hunting and food-gathering peoples of the present time suggests that the social structure of the Earlier and Middle Stone Age peoples of Africa may have *approached* that of man as we know him today. It is interesting that Clark sees in the archaeological record evidence of articulate speech, and is led to infer that within circumscribed areas the Middle Stone Ages peoples had a common language.

The Later Stone Age men probably had a social structure almost identical with that of the surviving Bushmen.

[15] Clark quotes (page 318) my suggestion that the occupation of caves depended on man having fire regularly available. In Africa there is no good evidence of the use of fire before Final Chelles-Acheul times. The discovery that the Sterkfontein caves had been entered by the Proto-Chelles-Acheul tool-makers might seem to contradict the hypothesis that there is a correlation between cave-dwelling and the use of fire. I do not think that it does. The dolomite caves in the Transvaal were probably entered by the early hominids during *day*-time in search of game or water, particularly under conditions of extreme dryness. Moreover, some of their activities may have required the shade of a rock-shelter at mid-day. But these same caves would have been avoided at dusk and throughout the night unless fire was available for use as protection against prowling carnivores.

Caves with unguarded entrances are particularly dangerous as *night* shelters for hominoids: for the simple reason that apes and men betray their presence by snoring.

By R. F. H. SUMMERS☆

[16] *A priori* the change takes place fastest during the *drying* phase, but this is also the period during which river deposits are laid down and so is the period about which we know most typologically. There is a possibility that too much weight might be given if one argues from observations only. I think that it ought to be stated that this is an *a priori* argument.

Geographically, cultural and industrial changes tend to take place quicker in drier, less favoured, marginal areas (compare Transvaal and Orange Free State with Southern Cape).

[17] The same phenomenon in a late Acheulian context has been noticed by a field worker (J. Masefield) on the Southern Rhodesia watershed near Lochard where sheet erosion has stripped a large area. Handaxes and "bolas" stones are concentrated in areas which Masefield considers to have been swampy. No bones remain, as the acid soil does not permit of their survival. (Unpublished information.)

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The Use of Sherd Weights and Counts in the Handling of Archaeological Data

by Wilhelm G. Solheim II

IT HAS LONG BEEN customary to rely primarily on artifact counts when quantifying archaeological data. Relatively little attention has been paid to the mass of the artifacts. This disregard has resulted in the loss of much information otherwise inferable from potsherds, and this may well be true for other kinds of artifacts as well. In quantifying potsherds, both the mass and the number are of importance.

Gifford (1951:223) made use of sherd weight in quantifying his pottery data and had the following to say about this: "Weighing sherds seems to give more accurate statistical results than counting them. Accident or the character of the paste may account for the size of, and consequently the number of, sherds in a given block excavated, so that the count is variable. But no matter how large or how small the sherds are in a given block, their total weight will remain the same."

It is not the purpose of this article to advocate the use of one method over the other, but to show that quantifying by both weight and count and comparing the two results yields more information than either method by itself.

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The Editor received this article on October 1, 1959. Instead of the usual CA☆ treatment, it was agreed that, as a specific contribution to method, the article should be published (with some revision) as a basis for comparative comment and criticism. Comments based on experience in the use of this and similar techniques are now invited.

QUANTIFICATION BY SHERD WEIGHT AND COUNT

In recent research on the earthenware from a probable burial site in Sarawak (Borneo), both weights and counts of sherds were used in quantifying the data (Solheim MS). To illustrate the method used, three tables will be presented from the report on this material. As the specific varieties of the carved paddle-impressed pottery do not matter here, the eleven varieties and one miscellaneous group in the original tables will be signified by the letters *A* to *L*.

Table 1 gives the totals of the counts and weights for the site as a whole. Table 2 presents the totals for six-inch levels of the site. Table 3 contains totals for all depths from five different areas in the site. Six of the varieties of design (*B* to *G*) are related by a common system of bordering. The total of these varieties is found in column *T*. *A* makes up about half the total pottery classified. Varieties *H* to *K* and the miscellaneous group *L* are totaled in column *T'*, to compare as a group to *A* and *B* to *G*. In column *T''* is the sum total of all varieties.

PERCENTAGE DIFFERENCES BETWEEN WEIGHT AND COUNT

Cursory examination of any of the three tables shows that while the percentages of specific varieties by weight and by count are similar, they do differ considerably. If for a specific variety there is a consistent difference, there must be a logical explanation for that difference. It is in seeking the reasons for differences that the information is found which is not available by using either of the two quantities by itself.

The obvious general reason for the difference in the two percentages is the difference in size of the sherds of each variety. This is borne out by the number of sherds per ounce for each variety. What are the reasons for this difference in sherd size?

Two factors are involved in the differential size of the sherds. These are: (1) the ease of recognition of the

TABLE 1

TOTALS, PERCENTAGES, AND THE NUMBER OF PIECES PER OUNCE OF THE CLASSIFIED SHERDS

	A	*B*	*C*	*D*	*E*	*F*	*G*	*T*	*H*	*I*	*J*	*K*	*L*	*T'*	*T"*
Weight	1,040	264	228	201	82	118	31	924	62	51	29	25	63	230	2,194
%	47	13	10	9	4	6	1	42	3	2	1	1	3	11	—
Number	3,042	466	507	406	202	162	68	1,811	120	101	74	45	124	464	5,317
%	58	9	10	7	4	3	1	34	2	2	1	1	2	8	—
Pc./Oz.	2.9	1.8	2.2	2.0	2.5	1.4	2.2	2.0	1.9	2.0	2.5	1.8	2.6	2.0	2.4

variety, and (2) the absolute size of the sherds of each variety. The first factor is a function of the classifier, while the second is a function of the pottery itself. They are independent variables. The relative importance of the two must be decided by subjective judgment.

To illustrate the first, in the tables just presented, variety *A* is the easiest to recognize of all the patterns, and can be recognized in small or large sherds with equal facility. The other patterns are more complex and more difficult to recognize in small sherds. This is certainly part of the explanation for the sherds of variety *A* having the smallest average size with the percentage by number greater than the percentage by weight.

The second factor of absolute size is, in turn, governed by several other factors, such as differences in hardness, form, thickness, or other mechanical features. With consistent differences among pottery varieties in any or all of these, there would be differences in the size of the sherds. If there is a consistent difference in any or all of these factors, it is a purposeful result of the potters' work and probably indicates a difference in function. For example, pottery made specifically for funerary purposes may be more carefully made, but less well fired, than pottery for everyday use; this would result in physical differences in the baked clay which could end in one kind breaking into smaller pieces than the other under similar conditions. Structurally, some vessels are stronger than others because of their form. Finally, thick vessels, unless they crumbled, would break into heavier pieces than thin vessels. One logical reason for a consistent difference in thickness of various kinds of vessels would lie with the two separate func-

TABLE 2

TOTALS, PERCENTAGES, AND THE NUMBER OF PIECES PER OUNCE OF CLASSIFIED SHERDS BY LEVELS

		A	*B*	*C*	*D*	*E*	*F*	*G*	*T*	*H*	*I*	*J*	*K*	*L*	*T'*	*T"*
0-6"	Weight	273	53	61	52	7	34	7	214	20	23	12	9	21	85	572
	%	48	9	11	9	1	6	1	37	4	4	2	2	3	15	25
	Number	728	115	140	95	16	33	18	417	32	40	33	17	44	165	1,311
	%	55	9	11	7	1	3	1	32	2	3	3	1	3	13	25
	Pc./Oz.	2.6	2.2	2.3	1.8	2.3	1.0	2.6	1.9	1.6	1.7	2.7	1.9	2.1	1.9	2.3
6-12"	Weight	348	118	68	61	38	37	4	326	23	18	6	14	29	90	764
	%	45	15	9	7	5	5	1	43	3	2	1	2	4	12	35
	Number	1,101	165	147	121	118	42	15	608	43	31	20	21	42	157	1,866
	%	59	9	8	6	6	2	1	33	3	2	1	1	2	8	35
	Pc./Oz.	3.2	1.4	2.2	2.0	3.1	1.1	3.7	1.9	1.9	1.7	3.3	1.5	1.4	1.7	2.4
12-18"	Weight	382	77	86	75	34	39	19	330	16	10	9	1	11	47	759
	%	50	11	11	10	5	5	3	44	2	1	1	—	1	6	35
	Number	1,072	156	189	171	62	74	32	684	41	30	15	4	32	122	1,878
	%	57	8	10	9	3	4	2	37	2	2	1	—	2	6	35
	Pc./Oz.	2.8	2.0	2.2	2.3	1.8	1.9	1.7	2.1	2.6	3.0	1.7	4.0	2.9	2.6	2.5
18-24"	Weight	37	16	15	13	3	8	1	56	3	0	2	1	2	8	101
	%	36	16	15	13	3	8	1	56	3	0	2	1	2	8	5
	Number	141	30	31	20	6	13	3	103	4	0	6	3	6	19	263
	%	54	11	12	8	2	5	1	39	2	0	2	1	2	7	5
	Pc./Oz.	3.8	1.9	2.1	1.5	2.0	1.6	3.0	1.8	1.3	—	3.0	1.0	3.0	2.4	2.6

tions of storage and cooking. For a storage vessel, there would be an obvious advantage in having thick walls that would not break easily. This would be a disadvantage in cooking vessels, where thinner walls would be less likely to break from unequal expansion due to contact with fire.

None of these latter factors is ordinarily obvious in classification by variety. However, when size differences between varieties are noted, the examination and comparison of some of the larger sherds of the varieties in question may indicate the reason. The differences in percentage call attention to differences in varieties, other than their appearance, which need explanation (for examples, see Solheim MS).

MEANINGS OF PERCENTAGE DIFFERENCE AND DIFFERENCE IN SHERD SIZE

Examination of Tables 2 and 3 reveals two curious facts which, when explained, present a valuable tool for evaluation of a site as a whole. In the percentages of the different varieties by weight and count in the different levels of excavation, there is the usual variation between the two, and yet, for each level, the two percentages of the total are exactly the same. On the other hand, with the same variation in percentages of the different varieties from different areas, the percentages of the totals are by no means the same. This is an indication of the homogeneity of the site.

If a large number of sherds of different varieties showing the differences found in Table 1 were thoroughly mixed, a number of samples taken at random should have differences in the two percentages for individual varieties and for the groups of varieties, but the two percentages of the total of each sample should be the same. This is because a random sample should be representative of the whole, and in the whole the percentages of the totals must both be 100%. If the samples are not random, one variety being more heavily represented in one sample than in another, the two percentages of the total quantity of sherds in a sample

TABLE 3

TOTALS, PERCENTAGES, AND THE NUMBER OF PIECES PER OUNCE OF CLASSIFIED SHERDS BY AREA

		A	*B*	*C*	*D*	*E*	*F*	*G*	*T*	*H*	*I*	*J*	*K*	*L*	*T'*	*T"*
Area 1	Weight	181	55	40	7	20	19	4	145	9	9	4	3	8	33	359
	%	50	15	11	2	6	5	1	41	3	3	1	1	2	9	19
	Number	565	115	90	15	44	32	4	300	15	18	11	9	21	74	939
	%	60	12	10	2	5	3	—	32	2	2	1	1	2	8	22
	Pc./Oz.	3.1	2.1	2.2	2.1	2.2	1.7	1.0	2.1	1.7	2.0	2.8	3.0	2.6	2.2	2.6
Area 2	Weight	40	23	10	3	4	3	5	48	0	6	0	7	1	14	102
	%	39	23	10	3	4	3	5	47	0	6	0	7	1	14	5
	Number	116	28	18	5	8	3	3	65	0	13	0	6	2	21	202
	%	57	14	9	2	4	2	2	32	0	6	0	3	1	11	5
	Pc./Oz.	2.9	1.2	1.8	1.7	2.0	1.0	.6	1.4	—	2.2	—	.9	2.0	1.5	2.0
Area 3	Weight	300	69	58	43	32	44	11	257	8	12	11	3	24	58	615
	%	49	11	9	7	7	7	2	42	1	2	2	1	4	9	32
	Number	549	111	115	102	87	38	27	480	17	26	27	8	22	100	1,129
	%	49	10	10	9	8	3	2	42	2	2	2	1	2	9	26
	Pc./Oz.	1.8	1.6	2.0	2.4	2.7	.9	2.5	1.9	2.1	2.2	2.5	2.7	.9	1.7	1.8
Area 4	Weight	294	56	59	101	19	27	3	264	20	6	10	3	7	46	605
	%	48	11	9	15	3	5	1	44	4	1	1	1	1	8	31
	Number	793	117	127	179	42	44	11	520	38	7	27	8	17	97	1,410
	%	56	8	9	13	3	3	1	37	3	—	2	1	1	7	33
	Pc./Oz.	2.7	2.1	2.1	1.8	2.2	1.6	3.7	2.0	1.9	1.2	2.7	2.7	2.4	2.4	2.3
Area 5	Weight	133	23	30	14	6	7	3	83	7	9	1	2	3	22	238
	%	56	10	13	6	2	3	1	35	3	4	—	1	1	9	12
	Number	376	37	78	29	18	23	14	199	24	25	4	7	10	70	645
	%	58	6	12	4	3	4	2	31	4	4	1	1	2	11	15
	Pc./Oz.	2.8	1.6	2.6	2.1	3.0	3.3	4.7	2.4	3.4	2.7	4.0	3.5	3.3	3.3	2.7

need not be the same. Therefore, if the percentages by weight and by count of the totals of several samples are the same within samples, the whole from which the samples were taken is homogeneous. If the percentages are not the same within samples, the whole is not homogeneous.

Applying this to Tables 2 and 3, we see that according to samples taken by level over the total area, the site is homogeneous. According to samples taken by area including all levels, the site is not homogeneous. Thus, vertically there is little or no variation in the site, but horizontally there are differences. In other words, the site was probably of short duration. More detailed examination of the tables elicits the reasons for the horizontal differences, and, from these, cultural inferences can be made as to the use of the site (see Solheim MS).

One caution on the use of this test of homogeneity should be expressed. It is determined by change or lack of change in sherd size resulting from differences in hardness, form, or thickness. There are no doubt numerous situations where these three factors have been stable over a period of time during which there may have been great change in styles of decoration. Unless there was a correlated variation in one or more of the factors of sherd size, vertically a site could appear to be homogeneous in such a situation.

Another interesting fact to be noted in Tables 2 and 3 is the change with depth of sherd size. The sherds per ounce of the total pottery by six-inch layers are 2.3, 2.4, 2.5, and 2.6, going down in depth. From the even difference in this direction, it is reasonable to infer that, during the use of the site, activity was at a constant rate. The greater number of times that the pottery of the lower layers had been walked over or otherwise disturbed led to consistently smaller pieces. Also, little vertical disturbance would be indicated. However, the sherds per ounce vary greatly in the different areas. A logical inference is that, for some reason, some areas were more disturbed than others. This is an interesting fact which would probably not be observed without information on the number of sherds per ounce.

TEST OF THE METHOD USING DIFFERENT DATA

The use of both weights and counts for quantfiying the Sarawak pottery was not done to test assumptions, but out of curiosity. The results were noted at first with incredulity and then with considerable excitement. When it began to appear that more than coincidence was involved, it was decided to test the method on another site. The one small site which could be worked over in the time available furnished similar interesting results. However, the test site was also from Sarawak, and it is possible that this form of analysis might work only for the particular variety of pottery found in that limited part of the world.

There is not much data readily available of the kind needed. Gifford (1951:223–24), to demonstrate his statement about the greater accuracy of weight over count, presented two tables giving both weight and count data from one excavated rectangle in Fiji. Unfortunately, the raw data presented are only for the total weight and number of sherds from different levels in the rectangle, but he does give the percentages of the major varieties by weight and by count and the number of pieces per ounce. Table 4 is a combination of Gifford's Tables 17 and 18, with added information.

The two percentages of the total sherds show little difference from the surface to 24 inches, but below this level there is a noticeable difference. Above this level there is relatively little change in the three varieties of pottery noted. Below this level there is an abrupt dropping off of the percentage of plain sherds and an increase in the percentage of relief sherds. One level lower the incised pottery falls off abruptly. From the information available in this table, there appears to be little change above 24 inches, but change below, and this agrees with the differences in the percentages.

So far as results can be checked, this is all that can be tested. At least two other facts of interest would require further examination of the raw data and of the sherds. The three different major varieties have distinctly dif-

TABLE 4

PERCENTAGES BY WEIGHT AND NUMBER AND THE NUMBER OF SHERDS PER OUNCE BY LEVELS OF POTTERY FROM AN ARCHAEOLOGICAL SITE IN FIJI

Depth	*Weight*	%	*Number*	%	*Pc./Oz.*	*Plain*			*Incised*			*Relief*		
						Wt.	*No.*	*Pc./Oz.*	*Wt.*	*No.*	*Pc./Oz.*	*Wt.*	*No.*	*Pc./Oz.*
6	269	18.8	1,883	19.2	7.00	79	89	7.5	17	9	4	4	2	5
12	177	12.3	1,271	13.0	7.18	80	90	8	16	7.5	3	4	2.5	4
18	124	8.6	801	8.2	6.46	81	91	7	14	4	2	5	5	6.5
24	208	14.5	1,510	15.4	7.26	82.5	90	8	10.5	5	3	7	5	5
30	210	14.7	1,710	17.5	8.14	76.5	89	8	10	4	3	13.5	7	4
36	195	13.6	1,392	14.2	7.29	74.5	82	9	3.5	1	4	22	16	7
42	148	10.3	798	8.1	5.39	47.5	60	8	0.5	0.3	4	52	39.5	4
48	56	3.9	269	2.7	4.80	49.5	60	7	—	—	—	50.5	40	4
74*	47	3.3	159	1.6	3.38	45	66	6	—	—	—	55	34	3
Total	1,434		9,793		6.83	%	%	7.6	%	%	3.3	%	%	5.3

*Not dug in six-inch levels

ferent sherd sizes. Very possibly, examination of the sherds would give some idea of why this is so. Judging from the sherd size of the total sherds, there was less disturbance in the 18-inch layer than in surrounding layers, and decreasing disturbance below 30 inches. This is matched by a smaller amount of pottery in corresponding layers. For the plain pottery alone, with the exception of the 18-inch layer, there is the expected small decrease in size of sherds to 36 inches, where rather rapid decrease in the number of sherds begins. This would suggest a fairly constant population above 36 inches with a sharp decrease represented in the 18-inch layer. Below 36 inches the decreasing disturbance suggests a decreasing population rather than a lesser use of pottery by a stable population; this would be considered the explanation had the sherd size continued decreasing. One factor in the increase in the lower layers of the total sherd size is the larger percentage of relief pottery which did not break into pieces as small as the plain. However, sherds of plain pottery start increasing in size below 36 inches.

SUMMARY AND CONCLUSIONS

In quantifying data on potsherds from an archaeological site it is of great inferential value to work out both sherd weights and sherd counts, for all varieties of the pottery, at all levels, and in all areas. Sherd count of a variety divided by sherd weight gives the number of sherds per ounce. If there is no noticeable difference in the size of the different sherd types, as expressed in the number of pieces per ounce, there will be no significant differences in the percentages of the types by weight and count. Thus the site would appear to be homogeneous and further comparisons would be useless. If there is a noticeable difference in the size of the different sherd types, further analysis is warranted. By comparing sherd sizes within one layer and area, between layers and areas, and totals of layers and areas much inferential information is obtained. Further, these comparisons call attention to questions which can be answered only by referring to the original data or to the sherds themselves. Similar comparisons of the differences of the percentages by weight and by count produce further information and suggest more questions.

In addition to the inferential information produced by this method of analysis, a simple test of site homogeneity becomes available. This test will probably be useful only when there is a consistent difference in sherd size among the pottery varieties or types classified. The test is based on the comparison of the percentages by weight and by count of the total weights and counts of all varieties for several different samples. The results of the test can be put in the form of a general hypothesis for further testing. (1) If the percentages by weight and by count of the total of all varieties for several different samples representing different layers in a site are very nearly the same, the site is vertically homogeneous. This would mean that there is little or no change of the pottery with depth, and the site was either of short duration or had little outside influence leading towards change. (2) If these percentages differ for different layers, the site is not vertically homogeneous. This would mean that there is a variation of pottery with depth, and the site was either of long duration or had outside influence leading towards rapid change. The horizontal homogeneity or lack of it is of cultural significance, and in either case will lead to cultural inferences concerning the site. No general hypothesis accounting for the observed differences or lack of difference can be advanced at this time. Every site may require unique explanations, as each site, to some degree, represents a unique situation.

This method of analysis, first used on the earthenware from a burial site in Sarawak, was tested on a second site in Sarawak, where it worked equally well. It was then tested using incomplete data from a site in Fiji and it worked within the limits of the data available. It should be further tested on pottery from other areas and possibly on other kinds of artifacts. The pottery from Fiji is not so distantly related to that of Borneo, both being finished and, at least in part, manufactured using paddle and anvil, the paddle often being carved. It may be that this method of handling quantified data will work with only this kind of pottery.

Various of the implicit assumptions made in answering some of the questions raised could be tested by mechanical examination of potsherds. It should be definitely determined that hardness, form, and thickness do affect sherd size, and in what way. There are probably other factors that affect sherd size which mechanical testing would reveal.

While this method of analysis is of value for research on one site, it does not answer the question of what form of quantified data to use for comparing sites. Possibly a qualified statistician could arrive at some ratio of the percentages by weight and by count which could be used for this purpose. For intersite comparison, Baumhoff and Heizer (1959) have called attention to a method for approximating the number of whole vessels of different kinds through the use of sherd weights. This provides data which not only can be used for site comparison but which would be useful for further cultural inferences within a site.

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Can the Mountain Gorillas Be Saved?

A Communication from Raymond A. Dart

THIS COMMUNICATION came from Dr. Dart as we were going to press with a story (p. 332) indicating how much we are likely soon to learn by study of mountain gorillas in their natural habitat. For a map showing locations mentioned, see our March issue, p. 94.—EDITOR.

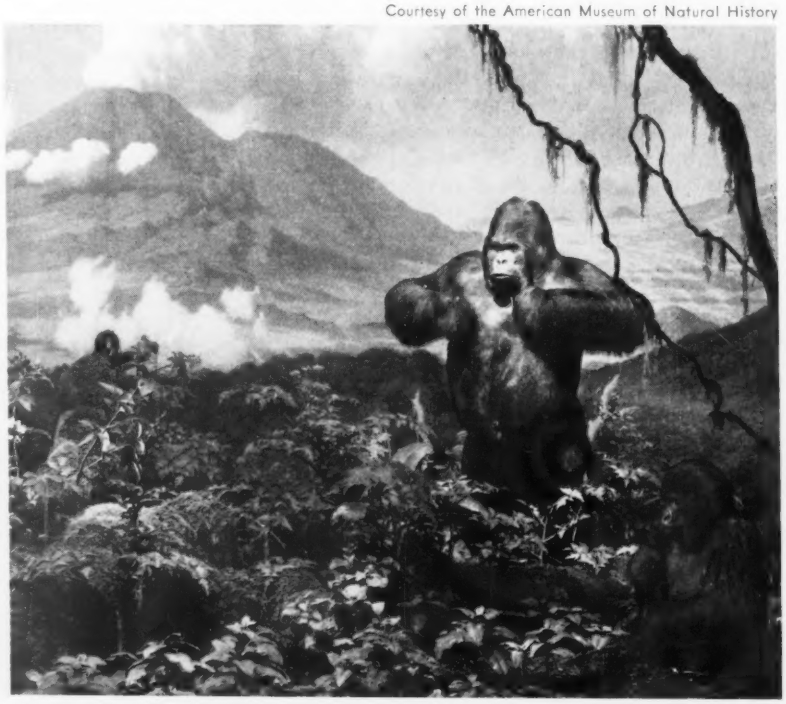
AT THE REQUEST of the Council of the South African Association for the Advancement of Science, there was drawn up and published recently a "Memorandum on the Preservation of the African Great Apes" (R. A. Dart, *South African Journal of Science*, 1960). On the adoption of the memorandum by the Council, a copy was referred to the Prime Minister of the Union of South Africa. Copies were referred also to all Associations for the Advancement of Science, everywhere, for their information, and with the suggestion that, in the event that they endorsed the principles involved, they make suitable representations (1) to inform their own national organisations for the preservation of flora and fauna, and (2) to inform their governments, so that official bodies could be assisted in giving directives to their representatives in any future discussions concerning the preservation of African flora and fauna that affected the African great apes. Since UNESCO had informed us that only thirteen countries other than South Africa have such Associations, steps are now being taken to forward the memorandum to the principal scientific bodies in all countries.

The imperfections in modern mechanisms of communication among scientists, in regard to matters of common interest and urgency, highlight the potential importance of the Wenner-Gren Foundation's action in establishing CURRENT ANTHROPOLOGY. Its world circulation affords a means of putting before scientists dedicated to the study of mankind the serious fact of the apparently inevitable extinction of the mountain gorilla, and it can thereby enable the scientists to, in turn, bring the facts directly to the attention of all who can assist in precluding such a fate.

Even late in 1959, when a memorandum from A. Kortlandt informed me about the virtual extinction of the orang-utan in Indonesia, through the removal of such restraints as had previously existed, I laboured under the misapprehension that, even if the Asiatic anthropoids were doomed, the African great apes might persist for some time. Doubtless this misapprehension is shared by thousands of my fellow scientists throughout the world. But this comfortable illusion was shattered in mid-March, 1960, when M. Degen, Administrative Secretary, at Bukavu on Lake Kivu, of the Commission de Cooperation Technique en Afrique au Sud du Sahara (Conseil Scientifique pour l'Afrique au Sud du Sahara), addressed a letter to our Council, thanking our Association for what had been done and requesting it to publicize the fact that the conservation of the gorillas living between Mikeno-Karasimbi volcanoes in the Albert Park was in immediate danger. This letter was accompanied by a document dealing with the history of the Albert Park, drawn up by the Institut des Parcs Nationaux du Congo Belge and transmitted from the London offices of the CCTA/CSA. The Council of our Association requested me to translate the document and have it published as soon as possible in the *South African Journal of Science* together with an appended report by George B. Schaller (University of Wisconsin, U.S.A.) on the actual condition of that area today. Obviously, many anthropologists in various parts of the world, who may be able to assist directly or indirectly toward the objective of preserving the African great apes, do not receive the *South African Journal of Science*. Thus the translated text of the document from L'Institut des Parcs Nationaux du Congo Belge, together with Schaller's report, are reproduced verbatim also, on the opposite page.

It is patent from this document and report, and from the "winds of change" circulating through Africa at this time, that the only hope of salvaging for posterity the relict faunal treasures of this and other continents lies in the enlightened understanding of world leaders. That, in turn, depends on the extent to which Associations for the Advancement of Science and similar bodies in all countries can awaken their governments and representatives at the United Nations Organization and UNESCO to act in the preservation of a heritage which fortunately still exists and belongs, not to any single country or people, but to humanity as a whole.

Courtesy of the American Museum of Natural History



TO: The Secretary, CCTA/CSA

We have the honour to forward to you herewith a note on the subject of the threat that menaces the preservation of the mountain gorillas, to whose protection we have been dedicated at the Parc National Albert for more than thirty years.

As a result of extreme vigilance, we have been able to avoid any modification of the habitat of these anthropoids. Today the gravity of the situation forces us to appeal to international opinion with the hope of being able in this way to avoid an irreparable loss to science.

We venture to hope that you will assist us in our effort by using every means at your disposal so as to augment our vigorous protests against the violation of a sanctuary, where there live today the last representatives of an anthropomorphic progeny whose disappearance would have a criminal quality.

Sd./ Institut des Parcs Nationaux du Congo Belge

THE PRESERVATION OF THE GORILLAS IN THE PARC NATIONAL ALBERT IS THREATENED

In 1920, the American naturalist Carl Akeley explored the region of the Kivu volcanoes to collect information about a type of gorilla whose presence there had been reported. It concerned a particular race adapted to the conditions of the rugged climate prevailing at an elevation of more than 3,000 metres.

The number of these anthropoids did not appear to be great. Carl Akeley's observations threw into relief the necessity for assuring the protection of this nucleus of strange beings of gigantic bodily proportions.

King Albert interested himself personally in the preservation of these gorillas and in 1925 he signed a decree creating a reserve, named "Parc National Albert," set aside to render the territory where they lived inviolate.

During a further research expedition, conducted in 1926, Carl Akeley died in the very heart of this sanctuary for the creation of which he had struggled. He was buried at Kabara at a height of 3,200 metres between the extinct volcanoes Mikeno and Karasimbi.

To assure the preservation of the habitat of the gorillas, to assure also the conservation of the forests that cover the flanks of the volcanoes and whose presence conditions the climatic equilibrium of all that Kivu region, it was regarded as essential to extend protection to the immediately neighbouring regions. In 1929 a new decree incorporated in the initial reserve all the region of the Virunga volcanoes, thus assuring a protective belt around the gorilla habitat.

In order to free the protected region from all extraneous influences, the administration of the Parc National Albert was entrusted to an independent institution which, in 1934, took the title of Institute of the National Parks of the Belgian Congo.

As a result of these far-sighted measures, the sanctuary of the gorillas was freed from all human interference during more than thirty years. With the object of ensuring amidst the most complete quietude the development of some gorilla families, whose presence had been established in 1925, the Institute of the National Parks did not allow other than a few rare entries into the sanctuary.

Actually the number of gorillas living in the region is estimated at more than 350, a fact that demonstrates the efficiency of the protection from which they have benefited.

The gorilla sanctuary is situated partly in the Congo and partly in Ruanda-Urundi. Unfortunately, in Ruanda a cult of cattle is practised, introduced by the Watutsi who came formerly from the region of the Nile. The social importance of their proprietor is dependent upon the number of heads of cattle he possesses; further, no beasts are sacrificed for consumption as food. This fruitless pasturage has led to a total disappearance of wooded vegetation and erosion of the whole countryside, where only a few shreds of forest remain, such as those covering the sides of the volcanoes.

A strong demographic pressure has had as its corollary an increment of beasts and an insufficiency of pastures; augmented by cultural development it has induced the herdsmen to thrust their herds into the forests of the Parc National Albert.

For many years our institution has been struggling in vain to put a stop to these disastrous inroads that result in the disappearance of the forest cover. But, bereft of support from administrative and judicial authorities, the Institute has seen that it is powerless to arrest this invasion.

Under the pressure of the Ruanda-Urundi government a retrocession of some 7,000 hectares (or approximately 17,000 acres) of the Parc National Albert has had to be accepted, in the hope that that concession would permit the responsible authorities to regulate their pastures and to take appropriate measures to moderate the multiplication of livestock composed for the most part of worthless and sickly beasts. That procedure has been useless and the herdsmen have continued to thrust their herds further and further into the Parc National Albert with impunity.

Today after twenty-five years of protective efforts, the mountain gorillas in their sanctuary are threatened with irremediable destruction.

Under the auspices of the Institute an American mission has been devoting itself for about a year to a thorough study of the gorillas in the vicinity of the Mikeno and Karasimbi volcanoes. Herewith we are sending to you a copy of the report drawn up by George B. Schaller, member of that mission. This report is significant; if measures are not taken without delay, a gorilla population, probably unique in the world, will vanish.

Paralysed by political considerations, there is every reason to fear that the authorities will maintain their passive attitude. Consequently we are making an urgent appeal to international opinion in order that vigorous protests may be raised against the destruction of this scientific patrimony, the sanctuary of the gorillas of the Parc National Albert. Motives both moral and humane should inspire concerted action to save these anthropoids from certain extinction.

THE CONSERVATION OF GORILLAS IN THE VIRUNGA VOLCANOES

THE NUMBERS of gorillas in Parc Albert probably exceed 350 animals. The heaviest concentration occurs in the area lying between Mikene, Visoka and Karasimbi. Ten troops, comprising over 170 animals, have so far been encountered there. In the area between Visoka and Sabinio on the Congo side of the Parc, gorillas appear to be scarce, but between Sabinio and Muhavura, an area where the gorillas wander freely between Ruanda and Muhavura, four troops totalling over 40 animals have been noted over the past year. The Ruanda section of the Parc has not been visited by the author.

Habitat Preference

The area with the most abundant food supply and the largest concentration of gorillas is the Hagenia forest, between about 2,800 and 3,500 meters altitude. Bamboo, which covers a major portion of the Parc below 2,800 meters, furnishes ample food only during the wetter periods of the year when bamboo shoots and tender green stems are present. Other habitats such as the Muhavura saddle and the giant senecio zone above 3,500 meters are visited only sporadically and do not appear to support many animals.

Conservation

Poaching for red forest duiker and bushbuck appears to be fairly extensive in some sectors, especially Kibumba. Snares are encountered as high as 3,500 meters on the slopes of Karasimbi, and recently a hunting party apparently killed a buffalo near the Rukumi ^gîte. However, at present, gorillas rarely appear to be molested directly.

Habitat destruction is the greatest danger facing the gorillas in the Virunga volcanoes. On the Uganda side, the most desirable gorilla habitat lies outside the Forest Reserve and will be converted into shambas within about 3 years. Much of Mount Muhavura is already entirely unsuitable for gorillas. Two large tracts of Parc Albert on the Ruanda side have already been returned to the natives unofficially.

Although the habitat today appears to be still adequate for the support of the gorilla population, the animal will in the future not be able to survive if the present destruction by Watusi cattle continues. Watusi and their cattle venture far into the Congo side of the Parc. A visit into the area between Visoke and Sabinio in July, 1959, showed countless old cattle trails and huts over a mile into the Congo. More recently in December, 1959, and January, 1960, several hundred cattle were noted from the Ruanda border as far as 4 miles into the Congo, north and north-west of Visoka. A deep, well-used cattle trail enters the Congo south-west of and at the base of Visoka. At present, habitat destruction by cattle is primarily confined to some sectors at altitude below 3,000 meters. Although this is undoubtedly detrimental to the gorilla and other forms of wild life, an extension of this intrusion and an invasion into the Hagenia forest could well prove fatal to the perpetuation of wild life in the Virunga volcanoes.

GEORGE B. SCHALLER, Rumangabe
January 29, 1960

Research Reports

Current Field Studies of Gorillas

Information on the life history and behavior of the gorilla in its native habitat has been scant, due in part to the popular misconception that this animal is an elusive, treacherous, and essentially unapproachable beast. The first convincing demonstration that gorillas could be approached and watched without fear of attack came in 1957 from Walter Baumgartel, a hotel-keeper in Kisoro, Uganda, and several biologists who accompanied him and his native guides into the forests at the eastern end of the Virunga Volcano chain. Skill in stalking, a basic understanding of the forest, and a genuine appreciation of the great man-like apes that live there were the keys to their success.

An over-all survey of the ecology and natural history of the mountain gorilla, with emphasis on life habits, troop movements, and social behavior, was launched by the New York Zoological Society in February, 1959, with financial support from the National Science Foundation (U.S.A.). The author and George Schaller were sent to Central Africa, first to survey the geographical distribution and status of the species, and then to make an intensive study of its life history at a site selected on the basis of the survey. The survey was completed in July, 1959, and will be reported in full in the near future in *Zoologica* (Vol. 45, 1960). The intensive study is currently being conducted by Schaller in the central Virunga Volcanoes in Albert National Park, and will be extended to the end of 1960.

The data, of course, are incomplete at this writing, and it would be unwise to attempt any predictions of the ultimate conclusions of the study. A number of preliminary observations may be recounted, however, which will give some notion of the nature of the work and its findings.

Gorillas were found to be concentrated in about sixty semi-isolated colonies or areas of from 10 to 120 square miles each, stretching south from the equator and west from the Albertine Rift over a total range of about 35,000 square miles. Within this region the altitude, climate, topography, and flora vary widely, but all populated areas are characterized by forest vegetation, generally broken and with patches of secondary growth and herbaceous ground cover. In the equatorial forests west of the Rift, the prevailing 10- to 15-year cycle of clearing and cultivation produces a patchwork of secondary forest stands in various stages of recovery, which is favorable to gorillas. The more drastic and permanent forest clearing practiced on the rich soils of the Rift has cut deeply into the few forest strongholds of the species in this region, and constitutes a persisting threat to its continued existence there.

Notable success has been achieved in stalking and observing gorilla troops in the forests of the Virunga Volcanoes. Through special permission granted by the Institute of National Parks of the Belgian Congo, we were able to establish a base camp in a closed area of the Albert Park, where gorillas remain essentially undisturbed in a natural forest setting. A steeply undulating topography covered with a rather open stand of broad-crowned *Hagenia* trees provides an excellent setting for observation.

The animals proved to be excellent subjects for patient and quiet study. Best results were obtained when we worked alone. At first, great caution was exercised in attempts to approach the animals undetected. This was difficult, however, and was soon dropped as it became apparent that awareness of the observer might even aid observation, since the usual response of the gorillas under these circumstances was to congregate and watch the observer from an open situation at favorable range. But in capitalizing on this cooperative response of our subjects, we were, of course, being frustrated in our ultimate objective of studying undisturbed animals. This new difficulty was largely resolved for us by the gorillas, as, with repeated encounters over periods of weeks and months, they came to accept us and to proceed with all forms of activity, regardless of our presence. Cautious curiosity gave way to apparent obliviousness, or occasionally to intimate investigation. One troop has repeatedly approached Schaller to within 15 or 20 feet, formed a semicircle around him, or climbed into neighboring trees. On one occasion, several animals briefly visited the very branch on which he was seated taking notes.

With such a high degree of rapport, it has been possible for Schaller to observe many details of the behavior and social interactions of these animals. He has found that a high level of social tolerance prevails among members of a troop and even between troops. Several of the troops he has studied include more than one adult male, and he has never observed signs of aggressiveness among them. Isolated and peripheral males exist, as among other primates; and it is surprising that even these may be accepted into troops without visible displays of antagonism. Neighboring troops have been watched as they peacefully met, socialized, and separated.

Gorilla troops are apparently nomadic within vaguely defined spatial limits. Some restriction to a broad area of familiarity is suggested as the animals wander back and forth, bedding down in a new site each night, and rarely retracing the exact course of a previous route. No traces of territorial behavior have been detected.

Observations on special mechanisms of communication and on manipulatory skills are, of course, being eagerly sought. Findings in these areas are rather unspectacular, however, and we tentatively believe that evolutionary progress along these lines has been slight.

Reported by JOHN T. EMLEN, JR.

Conferences

Social Life of Early Man

June 22–30, 1959 at Burg Wartenstein, Austria

Sponsored by The Wenner-Gren Foundation for Anthropological Research, Inc.

Organizing Chairman: Sherwood L. Washburn, University of California, Berkeley, Calif., U.S.A.

Participants, and their papers prepared and exchanged in advance:

FRANÇOIS BOURLIÈRE, Laboratoire de Physiologie, Paris. "Les divers types de structure sociale chez les Primates, d'après les observations de terrain."

M.R.A. CHANCE, Uffculme Clinic, Birmingham, England. "The Nature and some Special Features of the Instinctive Social Bond of Monkeys."

HEINI P. HEDIGER, Zoo and University, Zürich, Switzerland. "The Development of Territorial Behavior in Vertebrates, especially Mammals and Primates, and some Aspects of Social Behavior in Primates."

ADOLPH SCHULTZ, University of Zürich. "The Factors Influencing the Social Life of Primates in General."

SHERWOOD L. WASHBURN. "Social Life of Baboons."

F. M. BERGOUNIOUX, Institut Catholique, Toulouse, France. "Réflexions sur la mentalité des hommes primitifs."

ALBERTO C. BLANC, Instituto Italiano de Paleontologia Umana, Rome. "Evidence for the Ideologies of Early Man."

G. F. DEBETZ, Ethnographical Institute, Moscow. "Social Life of Paleolithic Man in Soviet Scholars' Works."

WILLIAM S. LAUGHLIN, University of Wisconsin, Madison, Wis., U.S.A. "Acquisition of Anatomical Knowledge by Ancient Man."

KENNETH P. OAKLEY, British Museum (Natural History), London. "On Man's Use of Fire, with Comments on Tool-Making and Hunting."

LUIS PERICOT-GARCIA, University of Barcelona, Spain. "Social Life of Spanish Paleolithic Hunters."

HENRI V. VALLOIS, Musée de l'Homme, Paris. "The Social Life of Early Man: Evidence of Skeletons."

A. IRVING HALLOWELL, University of Pennsylvania, Philadelphia, Pa., U.S.A. "Human Evolution in Socio-Psychological Perspective."

CARL O. SAUER, University of California, Berkeley, U.S.A. "Antecedents to Agricultural Society."

Other participants:

E. W. CASPARI, Wesleyan University, Middletown, Conn., U.S.A.

JOHN W. DODDS, Stanford University, Stanford, Calif., U.S.A.

IAGO GALDSTON, The New York Academy of Medicine, New York.

DAVID A. HAMBURG, National Institute of Mental Health, Bethesda, Md., U.S.A.

F. CLARK HOWELL, University of Chicago, Chicago, Ill., U.S.A.

JEAN PIVETEAU, Laboratoire de Paléontologie, Sorbonne, Paris.

SOL TAX, University of Chicago.

Discussion:

Section 1 of the conference concerned the general features of primate society that probably had much in common with those of man's pre-human ancestors. Baboon behavior was compared with that which may have characterized the australopithecines, and there was much discussion of the effects of bipedal locomotion, tools, and hunting. Section 2 considered the evidence of fossil man, and discussion contrasted the rich life of Upper Paleolithic man, who had art, dance, and many kinds of tools, with life in earlier periods, for which the remains that have been found are much simpler. Starting with evidence of tools, fire, and hunting, the discussants speculated on the size of early human groups, their territorial range, and their way of life.

Publication:

The papers will be published in 1960, probably in the *Viking Fund Publications in Anthropology*.

Research Plans

▶ **Hebrew Mythology**

I have begun to collaborate with Robert Graves on a book to be entitled *Hebrew Mythology*. I shall supply the Hebrew and Aramaic source material (Bible, Apocrypha, Talmudic and Midrashic literature), the ancient Near Eastern background, and the general anthropological approach to the treatment of the myths. Graves will supply the New Testament material and discuss the Hebrew and ancient Near Eastern influences on Greek mythology and the Hellenistic influences on mythological material in the Talmud and Midrash.

RAFAEL PATAI

▶ **Sirionó Grammar**

The language and complete vocabulary of the Sirionó Indians of eastern Bolivia was collected by Fr. Anselmo Schermair, Mis. Ap. The first part of his 2,000-page manuscript was published in 1958 as a *Vocabulario Sirionó-Castellano* (Austria: Sprachwissenschaftliches Seminar der Universität). The preparation of the second part, *Vocabulario-Indice Castellano-Sirionó*, was completed in 1959, and is ready for press. It will aid scholars in linguistics, ethnology, and anthropology who wish to find quickly particular basic concepts contained in the first volume. The work on the third and concluding part, a revised synopsis of grammatical features to be given in a "Gramática de Sirionó Practicado," has already been taken up by the author, who will be glad to receive suggestions and wishes regarding the matter.

P. E.-K. GIERTLER

Serial Publications

▶ *World Agricultural Economics and Rural Sociology Abstracts*, a journal founded in 1959, is published quarterly by the INTERNATIONAL ASSOCIATION OF AGRICULTURAL LIBRARIANS AND DOCUMENTALISTS, in co-operation with the INTERNATIONAL CONFERENCE OF AGRICULTURAL ECONOMISTS. Established as a world-wide information service for the relatively new fields of agricultural economics and rural sociology, the journal also covers such related fields as agricultural education, legislation, geography, and history. It plans to give complete and equal coverage to all countries and languages.

For ready reference to the more important publications in its area, the journal includes complete bibliographical details identifying the publications listed, as well as English translations of titles in less widely used languages. In most cases brief abstracts or summaries in English are given of the contents or conclusions. The preface and the table of contents and chapter headings are also printed in French, German, and Spanish. Listings are generally restricted to scientific publications that give the results of original research or offer considerable information; publications of purely local interest are usually excluded. Abstracts are arranged by subject. Each number includes an alphabetical author index, and subject and geographical indexes will be supplied for each volume. Each quarterly issue includes 400 to 600 references, with an annual volume numbering about 400 pages.

The *Abstracts* are edited by Sigmund von Frauendorfer, formerly Chief of Service (Librarian) at the International Institute of Agriculture, Rome. He will be assisted by an editorial board composed of well-known agricultural economists from several countries who will secure co-operation with international organizations and agencies, as well as with national societies and institutions concerned with economic and social aspects of agriculture.

Editorial correspondence should be addressed to the Editor, Prof. Dr. Sigmund von Frauendorfer, International Association of Agricultural Librarians and Documentalists, Library Hochschule für Bodenkultur, Vienna XVIII/110, Austria. Subscriptions may be entered with the North-Holland Publishing Company, P.O. Box 103, Amsterdam, Netherlands. Annual subscriptions are Gld. 47.50, 95*s*., or U.S.A. $12.50, or the equivalent in other currencies.

▶ Starting with the first issue for 1960, the *Bulletin* of the AMERICAN ANTHROPOLOGICAL ASSOCIATION is being replaced by a *Fellow Newsletter* comprising ten numbers a year, issued each month except July and August. Edited at the Washington office of the Association, the *Fellow Newsletter* will be sent without charge only to Fellows; others may subscribe at the rate of U.S.A. $2.00 per year. The change in format is intended to help meet the growing need for more frequent communication among the increasing number of professional anthropologists in the U.S.A. Subscriptions, news items, and other communications should be addressed to: The American Anthropological Association, 1530 P Street, N.W., Washington 5, D.C., U.S.A.

▶ The RESEARCH LABORATORY FOR ARCHAEOLOGY AND THE HISTORY OF ART, Oxford, was established in 1955 to develop physical and chemical methods of use to archaeology, including technical aids to field surveys, non-destructive techniques of ceramic and metal analysis, and new methods of dating. Research conducted at the Laboratory is reported in its bulletin *Archaeometry*,

at present published annually. Providing a channel for rapid circulation of the results of research completed at the Laboratory, *Archaeometry* also publishes reports of partially successful projects and interim reports of work in progress. The subscription price is 5*s*. (U.S.A. $1.00) annually. Subscriptions may be entered with E. T. Hall, Research Laboratory for Archaeology and the History of Art, 6 Keble Road, Oxford, England.

▶ *Gwerin*, an international journal of folk life that first appeared in 1956, is published twice a year under the editorship of Iorwerth C. Peate, Curator of the Welsh Folk Museum, St. Fagans, Cardiff, Wales. An authoritative journal dealing with all aspects of folk life in Great Britain and Ireland, and their relations with Scandinavia and the rest of Europe, *Gwerin* is self-supporting and independent, and is not the organ of any society or group. The price of an annual subscription is 15 shillings; a single issue costs 0/7/6. Editorial correspondence and books to be reviewed should be sent to Dr. Iorwerth C. Peate, Editor of *Gwerin*, St. Fagans Castle, Nr. Cardiff, Wales. Subscriptions are payable direct to Basil Blackwell, Publisher, 49 Broad Street, Oxford, England.

▶ The *International Bibliography of Social and Cultural Anthropology*, published annually by the INTERNATIONAL COMMITTEE FOR SOCIAL SCIENCES DOCUMENTATION, UNESCO, includes references to all books and articles published throughout the world, in any language. The *Bibliography* contains full references of every publication, with an English or French translation of the title if not in either of these languages. There is a comprehensive index of authors and subject matters, and a list of anthropological journals. Besides social and cultural anthropology, the *Bibliography* covers ethnology, archaeology, linguistics, folklore, applied anthropology, and historical and geographical material of anthropological relevance. The last volume published includes over 5,000 references, with a list of some 750 journals. Volumes for the years 1955, 1956, and 1957 have already been published. Volume IV, dealing with material published in 1958, is in press, and Volume V (1959) is now in preparation.

The *Bibliography* costs U.S.A. $7.00, £1/15/0, or NF. 24.75, and may be obtained from UNESCO agents in all countries. The editorial office is at the Fondation National des Sciences Politiques, 27, Rue Saint-Guillaume, Paris 7, France (Secretary, J. Viet). The International Committee for Social Sciences Documentation also publishes annual bibliographies in the fields of Social Sciences, Political Science, Economics, Law, and Sociology, from the same editorial offices.

Comments and suggestions for the improvement of the *Bibliography of Social and Cultural Anthropology* will be welcome, and should be sent either to the Secretary, or to the Editor, J.F.M. Middleton, Dept. of Anthropology, University College, London, W.C.1, England.

▶ With the recent broadening of its interests to include research in the whole field of anthropology, the CANADIAN RESEARCH CENTER FOR ANTHROPOLOGY is issuing its official organ, *Anthropologica*, in a new series that began with Volume 1, 1959. First published in 1955 in mimeographed form, *Anthropologica* is now issued twice a year in enlarged form as a printed journal, concerned with studies of the ethnic groups of Canada and with general anthropology. Although preference is given to Canadian material, the journal is by no means limited to such. Manuscripts are accepted and published in English and in French. Editorial correspondence should be referred to Marcel Rioux, 397 Meadow Drive, Ottawa, Ontario, Canada. Subscriptions may be sent to The Canadian Research Center for Anthropology, Oblate Avenue, Ottawa. The annual subscription fee is Can. $5.00.

▶ "Sources Orientales" is a new series of studies in mythology, published through Éditions du Seuil, Paris, by a group of orientalist scholars interested in the history of religion. Each volume includes a series of documents translated from the original into French, with commentaries and notes, and concerns one specific religious problem. The first volume, *La Naissance du Monde*, was devoted to myths of origin; the second volume is dedicated to oneric literature, particularly dream books. Later volumes will concern other aspects of religion.

The collection presents selected materials from the ancient Near East, central and southern Asia, and the Far East. Parallel collections of the myths of other culture areas, in Africa, North and South America, Australia, etc., will be published later.

Sources Orientales is intended to make available documents that are normally published in very specialized reviews. The authors would like to provide further specific data concerning religious beliefs of mankind that would be of interest to anthropologists, folklorists, historians of ideas, and any scholars interested in the evolution of human beliefs. They hope the project will find some interest among scholars working in related fields. For information about the program, write to: MARCEL LEIBOVICI, 100 Rue de l'Abbé-Groult, Paris 15, France.

Wanted

▶ Offprints or abstracts of published articles and unpublished studies about the nomadic and semi-nomadic clans in North Africa and the Middle East (including Saudi Arabia, Iran, and Afghanistan). Received materials will be of great help in preparing an annotated bibliography on the dynamics of the sedentarization process among tribal nomadic groups in the area. This bibliography is sponsored by UNESCO.—A.M. ABOU-ZEID, 134 Prince Ibrahim Street, Sporting, Alexandria, Egypt.

▶ . . . Items for a current bibliography of historic archaeological sites in the U.S.A., including contact and post-contact Indian sites as well as American sites from the colonial and later periods. These will supplement the list of historical American sites now being compiled by the National Survey of Historic Sites and Buildings under the auspices of the National Park Service. The format for the bibliography will be identical with that used in CURRENT ANTHROPOLOGY. Each item should include name of site, location, and, if possible, ownership (private, municipal, state, or national).—DR. JOHN L. COTTER, National Park Service, 143 Third Street, Philadelphia 6, Pa., U.S.A.

▶ . . . Publications on physical anthropology, paleoanthropology, and/or evolution to be analyzed and reviewed in Spanish in a proposed series to be called *Cuadernos*. The purpose of this new periodical is to make such materials known to scholars and students in Spanish-speaking countries. Send publications and questions on how to receive *Cuadernos* to JUAN COMAS or SANTIAGO GENOVÉS, Instituto de Historia, Ciudad Universitaria, Mexico 20, D.F., Mexico.

▶ . . . Papers by anthropologists for publication in the *Jewish Journal of Sociology*. The first two numbers of the journal included several papers of direct anthropological interest, including A. E. Mourant, "Blood Groups of the Jews"; S. Strizower, "Jews as an Indian Caste"; D. Feitelson, "Some Aspects of the Social Life of the Kurdish Jews"; and M. Ginsberg, "On Prejudice." Manuscripts should be sent to the EDITOR, Jewish Journal of Sociology, 55 New Cavendish Street, London, W. 1, England.

▶ . . . Examples of the application of

tree-ring analysis to archaeological problems. I am particularly interested in documenting the use of the tree-ring method in areas of the world other than Alaska and the southwestern part of the United States. Correspondence concerning past or proposed applications, published or unpublished, is invited.—BRYANT BANNISTER, Laboratory of Tree-Ring Research, University of Arizona, Tucson, Arizona, U.S.A.

Future Meetings

Tenth Pacific Science Congress

August 21–September 6, 1961 in Honolulu, Hawaii, U.S.A.

The Tenth Pacific Science Congress of the Pacific Science Association will be held at the University of Hawaii, Honolulu, Hawaii, U.S.A., from August 21 to September 6, 1961. The National Academy of Sciences (U.S.A.) and the Bernice P. Bishop Museum, Honolulu, are sponsoring the congress, with the co-operation of the University of Hawaii. Scientific sessions will be held from August 21 to September 2, with a post-session field trip through September 6.

An international, regional, non-governmental scientific organization, the Pacific Science Association was founded in 1920 at the First Pan-Pacific Scientific Conference, in Honolulu. The Association's permanent headquarters is at the Bishop Museum, Honolulu. Previous congresses were held at Honolulu, 1920; Melbourne and Sydney, 1923; Tokyo, 1926; Batavia and Bandoeng, 1929; Victoria and Vancouver, 1933; Berkeley, Stanford, and San Francisco, 1939; Auckland and Christchurch, 1949; Quezon City, 1953; and Bangkok, 1957. Each Pacific Science Congress is held under the auspices of the organization representing the Pacific Science Association in the host country.

The Tenth Congress will include nine sections of papers: geophysical sciences, biological sciences, public health and medical sciences, agricultural sciences, forestry, conservation, anthropology and social sciences, geography, and scientific information. Besides the regular daily sessions, there will be a program of public lectures and evening panel discussions, and a display of exhibits. During the two weeks of meetings, there will also be visits to institutions and other places of interest on the island of Oahu, where Honolulu is situated. Following the closing plenary session on September 2, field trips will be offered to other islands of Hawaii.

Political entities eligible for membership in the Association include: American Samoa; Argentina; Australia; Cambodia; Canada; Chile; China (Republic of); Colombia; Costa Rica; Ecuador; El Salvador; Fiji; France; French Establishments in Oceania; Guam; Guatemala; Honduras; Hong Kong; Indonesia; Japan; South Korea; Laos; Macao; Malaya; Mexico; Netherlands; Netherlands New Guinea; New Caledonia and Dependencies; New Zealand; Nicaragua; North Borneo; Panama; Peru; Philippines; Portugal; Portuguese Timor; Ryukyu Islands; Sarawak; Singapore; Thailand; Tonga; Union of Soviet Socialist Republics; United Kingdom; U.S.A.; U.S. Trust Territory of the Pacific Islands; Viet-Nam; Western Pacific High Commission Territories; and Western Samoa. The following non-member countries have also received invitations to participate: Bolivia, Burma, Denmark, Norway, and Sweden.

The Congress "Circular of Information," with more detail on programs, field trips, and other matters, will be issued in August, 1960. Please address inquiries to: Secretary-General, Tenth Pacific Science Congress, Bishop Museum, Honolulu 17, Hawaii, U.S.A.

Terminology

▶ "Monogamy" vs. "Henogamy"

T. P. Vukanovic, in an article "Monogamic Wives of Orthodox Priests" in *Folklore*, (Vol. 70, June, 1959), uses the term "monogamy" for a form of marriage that prohibits a second marriage of any kind under any conditions. This is no doubt a legitimate use of the word (cf. *Oxford English Dictionary*), but in general parlance "monogamy" has come to mean "marrying only one spouse at a time," and any other use is at first sight misleading. For monogamy in the sense used by Vukanovic, the term "henogamy" (cf. "henotheism") is suggested.

J. H. HUTTON

▶ Standardization of Tribal Names

. . . You should take into account not only the spelling of English, but also—and this seems important to me—the spelling and use of tribal names. One could write tribal names in a phonetically correct form, or—and this seems more practical—without using phonetic characters, but approaching the phonetic spelling as far as possible. (For instance, one should write "Masai" and not "Massai." There can be no confusion in pronunciation if a voiceless "s" is always written in this way, whereas the voiced sound is rendered by "z.") We should have general directions for the spelling of tribal names.

Also to be avoided is the use by different authors of different names for one and the same tribe. To avoid hopeless confusion, tribal names already in the literature should be retained. If handbooks are available in which tribal names are already standardized, this nomenclature should be adopted. In certain cases, there may be reason not to accept for ethnological articles a tribal name proposed in a linguistic handbook, because in ethnological literature another name is established (and vice versa), but this could be indicated and argued in a footnote.

JÜRGEN ZWERNEMANN

▶ Standardization of Terms in Prehistory

For those of us who are prehistorians, the basic problem in international communication is that of a standardized scientific terminology. Would you not consider a preliminary inquiry among as large a number of specialists as possible, which could be followed by questionnaires, and could lead to the establishment of an international lexicon where a definition of each term could be published in several languages (e.g., English, French, German, Italian, Spanish)?

J. TIXIER

▶ Eurindian and Eurafrican

Persons of mixed European and American Indian ancestry have been referred to by such derogatory and inaccurate terms as "half-breed," "half-blood," and "mestizo." These discriminatory appellations, which imply that the person of mixed "blood" is a mongrel or only half a person, should be replaced by an inoffensive term that will also be precise enough for the social scientist to use. "Half-breed," "mestizo," and similar terms are not necessarily restricted to a person of mixed Caucasian and Indian ancestry, but may apply to any hybrid.

To meet this need, I should like to propose the term *Eurindian* for any person of mixed Caucasian (European) and American Indian ancestry. A precedent for such a term is the designation of persons of mixed European and Asiatic ancestry as "Eurasian," a word that has long been accepted. *Eurindian* is clear and precise, and would apply only to persons of mixed Caucasian and American Indian ancestry. A Eurindian with Negro ancestry might be called an *Afro-Eurindian*, while a person of Negro and Indian ancestry might be termed an *Afro-Indian*. In my opinion, the term *Eurindian* would best apply to persons with equal parts of Indian and Caucasian ancestry, but would in general be applicable to any person whose mixed

heritage is effective in altering his status in society or in that segment of society to which he belongs.

A similar problem involves persons of mixed Negro and Caucasian ancestry. Such hybrids have usually been referred to by such derogatory terms as "mulatto" (little mule), or by terms that attempt to designate the amount of Negro ancestry (e.g., Quadroon and Octoroon). As a new and satisfactory word for persons of mixed Negro-Caucasian ancestry, I should like to propose *Eurafrican*, a term that would distinguish true Negroes from Negro-Caucasian hybrids.

The general adoption of these terms would, I feel, be of great value in giving the social scientist more precise linguistic tools. It would also be of great value in a sociological sense, since it might give these large groups of hybrids satisfactory and unifying names for themselves.

JACK D. FORBES, (Dept. History, San Fernando Valley State College Northridge, Calif., U.S.A.)

Translations

Russian Anthropological Publications on Northern Eurasia

With the support of the National Science Foundation, the ARCTIC INSTITUTE OF NORTH AMERICA has set up a translation project (*Anthropology of Northern Eurasia: Translations from Russian Sources*) to make Russian anthropological publications available to English-speaking anthropologists. To a certain extent it may be regarded as an extension in part of another Arctic Institute project, the *Arctic Bibliography*, which abstracts and indexes the contents of publications in all fields of science, and in all languages, relating to the Arctic and sub-Arctic regions of the world.

Much of the Russian anthropological literature, particularly that on the archaeology, ethnology, and physical anthropology of Siberia, has a direct bearing on problems of American anthropology. This applies to monographs published in *Materials and Investigations in the Archaeology of the U.S.S.R.*, *Works of the Institute of Ethnography*, and other monograph series, as well as shorter papers in such journals as *Soviet Archaeology*, *Soviet Ethnography*, *Brief Communications of the Institute for the History of Material Culture, and Brief Communications of the Institute of Ethnography*. During the last decade there has been scarcely an issue of these Russian journals that has not contained one or more papers of direct interest to Americanists. However, except for occasional translations and summaries presented by Chard, Krader, Michael, and Tolstoy, this Russian literature is not available to the majority of English-speaking anthropologists. English translations of selected articles and monographs from Russian anthropological series will, it is hoped, begin to meet this long-felt need.

The first publications selected by the Advisory Committee for translation are:

M. G. LEVIN, *Ethnic Anthropology and Ethnogenetic Problems of the Peoples of the Far East*. 1958.
S. I. RUDENKO, *The Ancient Culture of the Bering Sea Area: The Eskimo Problem*. 1947.
A. P. OKLADNIKOV, *Distant Past of the Maritime Provinces*.
A. P. OKLADNIKOV, *History of the Yakut A.S.S.R.* 1955.
A series of selected papers on ethnogenesis.
A series of selected papers on shamanism.
A series of selected papers on archaeology.

Every effort will be made to avoid duplication with the Russian Translation Series of the Peabody Museum of Archaeology and Ethnology, Harvard University. With the large amount of Russian material in need of translation, the two projects should supplement rather than duplicate one another.

The area to be covered will include all of Siberia, Outer Mongolia, Manchuria, Sakhalin, and the Kuriles, and in western Soviet Asia roughly the areas north of latitude 50. In the European U.S.S.R. the area to be covered will be mainly that north of latitude 60.

To make the translations available as quickly as possible, they will be printed in some inexpensive format, as a special publication series of the Arctic Institute of North America, and offered for sale at modest prices. Arrangements for the printing, sale, and storage of the translations will be made by the Washington office of the Arctic Institute, which will also assume administrative supervision of the project as a whole.

The Director of the project is Henry N. Michael of Temple University, Philadelphia, Pa., U.S.A. An Advisory Committee will suggest materials for translation and advise on matters pertaining to the publication and distribution of the translations. Members of the Committee are: Chester S. Chard, University of Wisconsin; Robert C. Faylor, Director Washington Office, Arctic Institute of North America; Lawrence Krader, American University; Margaret Lantis, U.S. Public Health Service; Dmitri B. Shimkin, Bureau of the Census; Marie Tremaine, Editor, *Arctic Bibliography*; the Chairman of the Publications Committee, Arctic Institute of North America; and Henry B. Collins, Smithsonian Institution (Chairman).

The Director and the Advisory Committee will be glad to receive suggestions and comments of any kind from Associates in CURRENT ANTHROPOLOGY.

Institutions

▶ The CERCLE LINGUISTIQUE DU CONGO BELGE ET DU RUANDA-URUNDI was founded in 1960 to promote linguistic studies in Central Africa. Among its interests are the study of African and Indo-European languages, general and applied linguistics, and ethno- and socio-linguistics, including onomastics, language contact, linguistic taboo, and *linguae francae*. Besides seminars and conferences, activities of the Cercle include the publication twice a year of a journal, *Ludimi*. Members of the Committee, who are drawn from the faculty of the Official University of the Belgian Congo and Ruanda-Urundi, include: E. Polomé, president; P. Remy, vice-president; A. Coupez, secretary; and J. Jacobs, treasurer. Subscriptions to *Ludimi* and membership fees are U.S.A. $4.00 a year, payable to the account of the Cercle: Banque du Congo Belge, compte no. 829.571, Elisabethville, Belgian Congo. The address of the Cercle is P.O. Box 3521, Elisabethville.

▶ Following its decision to completely reorganize the *Institut Français d'Afrique Noire* (IFAN), the government of the Republic of the Ivory Coast established a CENTRE DES SCIENCES HUMAINES in January, 1960. The Centre, a self-governing body, has been placed under the highly competent Minister of National Education of the Ivory Coast. Among its principal activities are organizing and developing research in ethnology, physical anthropology, archeology, prehistory, linguistics, and other anthropological fields, as well as work in economics, demography, and the study of the arts in general. The Centre des Sciences Humaines also is assuming the direction of the Musée de la Côte d'Ivoire, whose rich collections today number about 24,000 specimens. In international cultural exchanges, the Centre is in charge of furthering the world's knowledge of the Ivory Coast civilizations. It will assume the guidance and editing of scientific publications at all levels. B. Holas has been named Director of the Centre, in which capacity he is also Curator of the Musée de la Côte d'Ivoire at Abidjan.

Anthropological Institutions in Cracow, Poland

Archeology

JAGELLONIAN UNIVERSITY, Faculty of Philosophy and History: Chair of Polish Archeology, prof. dr. Rudolf Jamka; chair of Mediterranean Archeology, prof. dr. Maria Bernhard.

POLISH ACADEMY OF SCIENCES (PAN), Institute of the History of Material Cul-

ture, in Warsaw: (1) Section of Polish Archeology in Cracow, Kraków, ul. św. Jana 22. Head. prof. dr. Stefan Nosek. Founded 1953. Publications: "Sprawozdania Archeologiczne," four volumes of which have appeared. (2) Komisja Archeologiczna PAN. Chairman, prof. dr. Stefan Nosek. Publications: *Acta Carpathica*, of which volume 1 has been published.

MUZEUM ARCHEOLOGICZNE, Kraków, ul. św. Jana 22. Administrative officer, prof. dr. Stefan Nosek. Founded 1850. Formerly attached to the Polish Academy of Sciences and Letters in Cracow; at present, the municipal museum of the City of Cracow. Important archeological collections: interesting specimens of Polish archeology from Paleolithic era to the Middle Ages, as well as material from neighboring territories; fine numismatic collection, including Roman coins. Publications: *Materiały Archeologiczne*. Affiliations: Section of the Archeological Museum at Nowa Huta, Kraków, Nowa Huta, ul. Demakowa 30; Head of the Section, dr. Stanisław Buratyński; fine specimens of prehistoric blast furnaces.

STATE ART COLLECTION IN WAWEL, Archeological Section, Kraków, Wawel. Head of the Section, docent. dr. Andrzej Żaki; founded, 1953.

Social Anthropology, Polish and Slavonic Ethnography, Sociology

JAGELLONIAN UNIVERSITY, Faculty of Philosophy and History: Chair of General Anthropology (Social Anthropology) and Sociology, prof. dr. Kazimierz Dobrowolski; Chair of Slavonic Ethnography, prof. dr. Kazimierz Moszynski; Chair of Sociology and Demography, prof. dr. Paweł Rybicki.

POLISH ACADEMY OF SCIENCES (PAN), Institute of the History of Material Culture (IHKM), Warsaw: (1) Ethnographic Section in Cracow, Kraków, ul. Sebastiana 10m. 14. Head, prof. dr. Mieczysław Gładysz. Principal activities: research, mainly fieldwork conducted in rural districts, preparation of village monographs. Publications: *Etnografia Polska*, published for IHKM in Warsaw. (2), Komisja Etnograficzna (to be reinstituted shortly; founded as Komisja Antropologiczna in 1887 and transformed into Komisja Etnograficzna in 1925). Chairman, prof. dr. Tadeusz Seweryn. Principal activities: scientific sessions, publications. (3) Komisja Socjologiczna PAN (another former Cracow Academy Commission, re-established in 1959). Chairman, prof. dr. Kazimierz Dobrowolski. Principal activities: research in urban sociology, scientific sessions, publications to follow.

MUZEUM ETNOGRAFICZNE W KRAKOWIE, Kraków, Plac Wolnica 1. Administrative officer, director prof. dr. Tadeusz Seweryn. Founded 1905 by Seweryn Udziela, teacher and amateur collector; until 1939 situated in Wawel, since 1958 in its own building, the ancient town hall. Ethnographic collection: 24,000 items (3,000 on display), including old farming tools and implements; original peasant workshops, such as cloth-mills; original interiors of cottages; models of old rural housing from throughout Poland; peasant dress and costume; artistic dolls illustrating peasant dances, folk-art, and sculpture; paintings, including paintings on glass. Research facilities: Library of over 5,000 volumes, mainly Polish ethnography; rich archives, including drawings, paintings, etchings, plates, photographs, and manuscripts; total about 71,000 items. Publications: a series *Wydawnictwa Muzeum Etnograficznego w Krakowie* (14 volumes to date).

POLISH ETHNOLOGICAL SOCIETY (PTL), Wrocław, Nankera 4. m. 4. Founded 1895; president of the Society, prof. dr. T. Seweryn. The Cracow Section of the PTL, Kraków, ul. Gołębia 24. Chairman, dr. Anna Kowalska-Lewicka. Activities: meetings, popular lectures, demonstrations for schools, distribution of ethnographic publications, etc.

Folk Art

INSTITUTE OF ART OF THE POLISH ACADEMY OF SCIENCES (PAN), Section for the Study of Folk Plastic Art in Cracow, Kraków, Karmelicka 70. Head, prof. dr. Roman Reinfuss. Principal activities: Field studies and inventorying of folk plastic (i.e., excluding musical and literary folklore) art; international exchange of information on folk art. Research facilities: Drawings, plates, models, etc., over 50,000 items; photographs, 12,000 items. Publications: *Polska Sztuka Ludowa* (Polish Folk Art), a richly illustrated monthly.

Physical Anthropology

JAGELLONIAN UNIVERSITY, Faculty of Biology: Chair of Physical Anthropology, prof. dr. Kazimierz Stołyhwo. Attached to the chair is a small museum (about 5,000 items), including some interesting specimens of Ainu and Mongolian skulls.

Linguistics

JAGELLONIAN UNIVERSITY: Docent dr. Roman Stopa, African languages (Swahili and Khoisan), attached to the Chair of Oriental Philology. For full information, write to the Institute of Linguistics of the Jagellonian University, Kraków, Gołębia 20.

Note: most of the publications mentioned above have English or French summaries.

Information provided by A. WALIGORSKI, Kraków.

For Sale

▶ Because there have been many requests for documents growing out of Sol Tax's program of action anthropology among the Fox Indians, Iowa, U.S.A., these are now for the first time being made generally available. Fred Gearing and Lisa R. Peattie in 1955 brought together a first series in dittoed form. Robert Netting has now brought the work up to date, and the University of Chicago Department of Anthropology has reproduced a 432-page paperbound book, *A Documentary History of the Fox Project, 1948–1959*, edited by Fred Gearing, Robert Netting, and Lisa Peattie. The book is priced at U.S.A. $8.50, but CURRENT ANTHROPOLOGY Associates and special-rate subscribers may obtain it below cost, for $6.00 postpaid, by sending payment in advance to: DEPARTMENT OF ANTHROPOLOGY, UNIVERSITY OF CHICAGO, 1126 East 59th Street, Chicago 37, Ill., U.S.A.

▶ *Bibliography of Fossil Man, Part I: 1845–1955*. Mimeographed, 160 pp. Available for U.S.A. $1.00 from: GEORGE E. FAY, Box 87, Division of Social Science, Southern State College, Magnolia, Ark., U.S.A.

Free Materials

▶ *Plantation Systems of the New World*, Volume VII in its series of Social Science Monographs, is available without charge from the PAN AMERICAN UNION, Washington, D.C., U.S.A. A joint publication of the Research Institute for the Study of Man and the Pan American Union, the volume is a report on the Seminar on Plantation Systems in the Western Hemisphere, held in November, 1957, at San Juan, Puerto Rico. The Seminar brought together social scientists from throughout the Americas to discuss the plantation as a social, economic, cultural, and technological institution whose role in the historical development of many American countries was of vital importance. The monograph, which appeared in 1959, includes the papers presented at the Seminar, as well as summaries of the discussion that followed. It may be obtained from the Division of Science Development (Social Sciences), Department of Cultural Affairs, Pan American Union, Washington, D.C., U.S.A.

▶ A *Handbook of Pottery Types of Nayarit, Mexico*, is being prepared and will be available free to any interested persons.—GEORGE E. FAY, Box No. 87, Division of Social Science, Southern State College, Magnolia, Ark., U.S.A.

More on Lexicostatistics

SINCE PUBLICATION of Dell H. Hymes's "Lexicostatistics So Far" (CURRENT ANTHROPOLOGY [1960] 1:3–44), several individuals have sent comments on it either to the author or to the Editor. The Editor received comments from Ronald Cohen, Gordon W. Hewes, and G. N. O'Grady (by hand of A. Capell). Still other comments from, and/or about the work of, the following persons were received by Hymes: Herbert Harvey (regarding work of Dmitri B. Shimkin), Shirō Hattori, Harry Hoijer, Fred W. Householder, Jr., William S. Laughlin, Wilhelm Milke, Douglas Taylor, David D. Thomas, and Maner Thorpe. The former set of comments is reproduced here, and is followed by a contribution from Hymes that replies to all these communications in an attempt to bring the record and the discussion up to date. The material dealt with by Hymes falls into the categories of (*a*) history of the method, (*b*) basis of the method, especially with regard to the test list, and (*c*) cases of application.

Comments

By GORDON W. HEWES

The use of lexicostatistics as a tool for culture-historical reconstruction was at least broadly approached as early as 1850 by the British ethnologist Robert Gordon Latham (1812–1888), whom Haddon described as a "prodigy of learning." In an appendix to Latham's *The Natural History of the Varieties of Man* (London, 1850), in a section headed "General and Special Apophthegms," we find the following (p. 565):

> XXXIII. *Antiquity of the human species.*—This problem is most likely to be worked through the phaenomena of language. When determined it will give precision to the *recent period* of the geologist, converting it from a *relative* into a conventionally *absolute* epoch.
>
> XXXIV. The average rate at which languages change is capable of being approximated.
>
> XXXV. The *maximum* difference, at a given period, between two or more languages is also capable of being approximated.

I think that Latham's "Apophthegm XXXIV" is a more precise foreshadowing of glottochronology than the quotation from Sapir's *Time Perspective* of 1916, given by Hymes.

By G. N. O'GRADY

I

In attempting to elicit the 200-item Swadesh Test List in widely scattered Australian languages, I have invariably experienced serious difficulties which force me to conclude that no less than 69 of the items are either unsuitable or else need more precise definition in terms of the Australian environment. This opinion is reinforced by the evidence of extensive lexicons gathered by me in Nyaŋumada and Ka·ntyu (see map). It is significant that, of the 69 items in question, 65 are omitted or redefined also by Kenneth Hale, in a 268-item preliminary Test List which he devised independently for his Arandic comparisons.

The problems involved are grouped under six categories:

(1) Nine of the concepts appear to be absent from Australian languages: *count, five, four, freeze, ice, salt, sew, snow, year.*

(2) Certain large differences in referent ranges occur between items of the Swadesh List and Australian concepts. These differences are demonstrated herein diagrammatically, with Swadesh items in small case and Australian concepts in large.

(*a*) Of the Swadesh items, 25 [1] collectively embrace only a portion of the over-all referent range of 14 Australian concepts. In Table 1, English vocabulary items not involved in the Swadesh List are within parentheses.

(*b*) Seven Swadesh items with relatively wide referent ranges together involve over twenty Australian concepts. In attempting to elicit a term for *sand* from a Nyaŋumaḍa informant, one could record at least six possible morphemes: (i) wintiRi, (ii) ŋaRu, both of which are *white sand, white sandy beach*, (iii) pira *red sand, red sandy country*, (iv) pinṭa, (v) wiṇa—both *wet sand*

TABLE 1

fog	OVERNIGHT MOISTURE AT OR NEAR GROUND LEVEL	(dew)
fruit	VEGETABLE FOOD	(edible roots, seeds and berries, European-introduced flour, sugar, jam, tea, etc.)
animal bird	MEAT[2] (POTENTIAL OR ACTUAL)	meat, flesh
husband	SPOUSE	wife
stone	STONE OF UNDEFINED SIZE	mountain
at	LOCATIVE SUFFIX	in
walk; (go)	PROCEED IN UNDEFINED MEDIUM	fly, swim,[3] (sail)
hit with fist	KILL (POTENTIALLY OR ACTUALLY), WITH HAND[4]	kill
(shoot)	KILL (POTENTIALLY OR ACTUALLY), WITH MISSILE[4]	
stab, pierce (also spear, prick, prod, sew, knit, write	APPLY POINTED INSTRUMENT TO[4]	
lie	SLEEP (POTENTIALLY OR ACTUALLY)	sleep
say	IMPART INFORMATION ORALLY	(tell, inform)
scratch, as with fingernails, to relieve itch	SCRATCH A SURFACE (POTENTIALLY OR ACTUALLY MAKING A HOLE)	dig
think	REGISTER MENTALLY	hear; (feel, intrans.)

[1] Seven of these are not included in the 69 problem items: *dig, hear, hit with fist, meat, sleep, stone, walk.*

[2] A parallelism found in most Australian languages is *potential or actual fire*, i.e., *firewood* or *fire.*

[3] Terms for *fly* and *swim* exist in some languages, but *bird goes* or *fish goes* are frequently-recorded paraphrases.

[4] Numerous forms corresponding to *fight* exist; frequently the reciprocal form of one of these three verbs is used, the actual choice depending on the nature of the fighting tactics.

TABLE 2

RED SAND; WHITE SAND; BLACK SAND	sand	COARSE WHITE SAND; FINE WHITE SAND; WET SAND; DRY SAND
MYTHOLOGICAL NATIVE ROAD	road	EUROPEAN-TYPE ROAD
HAIR-STRING	rope	SINEW/STRING; EUROPEAN-TYPE ROPE
FRUIT SEED[5]	seed	SPINIFEX SEED; OTHER GRASS SEED
OLD (THING)	old	OLD MAN; OLD WOMAN
COME! (IMPERATIVE)	come	COME (OTHER MOODS)
ANOINT, RUB IN (OCHRE)	rub	RUB, E.G., TO RELIEVE MUSCULAR PAIN; RUB DELETERIOUSLY, ABRADE

TABLE 3

Language	*bite*	*eat*	*drink*	*breast/milk*	*mother*	*father*
Ka·ntyu	paṯa-	-	-	-	pa·pa	pi·pi
Wiraŋu	paṯa-	ŋa·l-	kapi ŋa·l-	ipi	-	-
Yulbaridja	patʸa-	ŋa-	-	-	-	-
Nyaŋumaḍa	patʸi-	ŋa-	-	-	pipi	-
Yindjibandi	pa-	ŋarku-	-	piwi	-	-
Dalandji	-	patʸa-	kayulu patʸa-	-	pipi	papu
Buduna	-	paya-	kayilu paya-	-	piwi	pawi
Yiŋgaḍa	patʸa	-	-	-	pipitʸuRa	-
Baladaŋ	paka-	ŋani-	kɐp ŋani-	pi·p	-	-

and (vi) punara *dry sand*. In Ka·ntyu I obtained five terms: (i) yaɾ^{ʔ}i *fine white sand,* (ii) wimpa *coarse white sand,* (iii) ampul *black sand,* (iv) wi·nti *wet sand,* and (v) lama *dry sand*. The problem is illustrated in Table 2.

(3) Certain compound and reduplicated equivalents of items in the Swadesh List involve the repetition of other items: (i) *bird:* in many languages either *wing-having* or *meat,* depending on the context; (ii) *new:* in some languages *now-from,* in others nyuwan (English *new one*)—S.A. Wurm finds the latter form to be widespread in New South Wales, and it also appears sporadically in Western Australia; (iii) *red:* often a reduplicated form of *blood;* (iv) *green:* often a reduplicated form of *grass.*

(4) Items of doubtful universality in Australia are: *lake* (for which *claypan* is suggested as a substitute) and *sea.*[6]

(5) Five items are especially difficult to elicit, both in vital and in partly broken-down languages: *all, dirty, because, few, some.*

(6) Greater precision of definition or even changes of meaning appear to be necessary for 25 further items. In the following alphabetical list, Swadesh items are followed by suggested innovations in parentheses. Changes suggested by Kenneth Hale are asterisked: *child* (*child from birth to puberty*)*; *cut* (*cut meat with knife*); *day* (*daytime*)*; *dry* (*dry sand*); *dull,*[7] *as knife* (*blunt point*)*; *grass* (*green grass*)*; *hunt* (*hunt kangaroos with fire*); *if* (*conditional, irrealis*)*; *know* (*knowing*)*; *leg* (*lower leg*)*; *live* (*remain, stay*); *man* (*fully initiated aboriginal man*)*; *many* (*moderately many*); *person* (*aborigine*)*; *sharp, as knife* (*sharp point*)*; *smooth* (*smooth surface*)*, (*ground naturally level*) or (*ground smoothed for a camp*); *stand* (*be standing*)*; *thick* (*fat, of person*)*; *thin* (*thin, of person*)*; *tie* (*tie leaves to stick*)*; *wet* (*wet sand*); *with* (*with, having*)*; *woods* (*thicket*); *worm* (*edible grub*)*; *yellow* (*yellow, as of wattle in bloom;* not *yellow ochre*). Hale also suggests specifying *egg* as *egg of bird other than emu.*

II

Apart from the difficulty of constructing a suitable Test List for Australia, there is also the fact that certain morphemes occur with semantic shifts from language to language, and each of the meanings involved in the shifts occurs in one or other of the Swadesh Lists. This is illustrated from languages located on the accompanying map. Morphemes which apparently have not undergone semantic shift are omitted from Table 3.

It appears to me that the neglect of semantic factors in cases such as in Table 3 could introduce marked skewing of final cognate percentages.

By RONALD COHEN

Hymes rejects the assumption of a set of pre-established ideas or meanings for which different languages merely have different tags (p. 8), and goes on to embrace the Sapir dictum that "the worlds in which different societies live are distinct worlds, not merely the same world with different labels attached."

Here is a point at which Sapir and evidently Hymes see an interpenetra-

[5] *Eye, fruit seed,* and *drop of moisture* make up the referent range of Nyaŋumaḍa pani.

[6] Kenneth Hale, however, reports finding borrowed terms for *sea* in languages spoken 500 miles inland.

[7] Many Australians, including the author, do not use *dull* with reference to bladed or pointed instruments.

tion of linguistics and social anthropology. As it is worded, the paragraph lumps together two levels of analysis which should be treated separately. First, the author treats of "universal ideas or meanings," i.e., of mental processes, and second, by quoting Sapir, he refers to "societies," i.e., to the sociological level of analysis. Glottochronology is held to confirm the thesis that since the number of words which languages needs must possess in common are numerically small, it follows that the number of universal ideas or meanings held in common among *Homo sapiens* is also small. Furthermore, because this is so, whole societies tend to live in "distinct worlds," i.e., their view of the world or reality is conditioned by the meaning-set given in vocabulary and in each lexical item in that vocabulary.

At the level of mental analysis, it is difficult to see just how a paucity of common meanings among lexical units in human languages can be taken as a confirmation or dis-confirmation of the presence or absence of universal ideas or meanings. Let us start by defining an idea as "a patterned reaction in the cerebral system to some item of experience obtained through the mechanisms of learning and perception." Lexical items in a language are not ideas *per se*, but symbols which usually refer not to one idea but to several, and thus the meaning of an utterance at any point in time is a listing of all the ideas to which it refers. For example, *red* means a colour, a communist, and can also refer to the past tense of the verb "to read." These various idea-referents of lexical items can change through time, and vary from language to language. That is to say, words in one language often have meanings which their closest equivalents in other languages do not have. This is a commonplace and underlies the difficulty of translation. However, it must be remembered that in comparing lexical items from one language to another we are comparing not ideas, but symbols which embody bundles or sets of ideas. Thus ideas *x*, *y*, and *z* may all be contained within one lexical item in language *A* and appear as dispersed ideas within several lexical items in language *B*. To confirm or dis-confirm the presence of universal ideas can only be done through the comparative analysis of the patterns of cerebral reaction to human experience among men. Given the exceptional similarity of biological make-up in man, it seems quite logical that many cerebral responses to universally held experiences should produce common ideas, and even common values within the species. The major point, however, is this: the analysis of lexical items and their meaning-referents has little or nothing to do with the existence of universal ideas or meaning. Such information must come from the cross-cultural analysis of perception and cognition, and not from the analysis of language. That such analysis must in turn use words to describe the processes of perception and cognition is beside the point, since these words are, or should be, scientifically derived concepts created in order to deal with a realm of reality which itself may or may not be present in the traditional speech patterns of any human group.

At the level of "society," the statement taken from Sapir is true and untrue at the same time, that is to say, it is an overgeneralization. Societies do live in different worlds, depending upon how the researcher defines "world," and these differences are often reflected in the words used by speakers in the various societies. Thus geography, social structure, and cultural history all combine to form certain unique features within the cultural institutions in any one area. These are in turn also reflected in the world view, in the value system, art, idiomatic and metaphorical modes of expression of a culture. Since language is part of culture, it obviously shares in this organization of values, outlook, history, and developed modes of expression. It is this organization of the world view which underlies the meaning-set of lexical items and accounts for the difficulties of translation. Thus "red" meaning communist has an historical explanation, while "I saw red" connoting anger has a metaphorical and cultural explanation. The Sapir statement is less true when we think of the nature of regularities at the level of "society." It is fairly obvious, despite the possible differences in world view, that similarities in historical condition, or geography, or perhaps most importantly, in social structure, possess at least the potentiality for producing predictably similar experiences, hence ideas, for the actors in these situations. In this latter sense, despite any possible linguistic differences or similarities, people undergoing similar experiences are living in comparable worlds. The point being made here can be summarized by reference to the concept of the "given," that is to say, of the common factor(s) present in any situation as distinct from the diverse peculiarities. This is the basis of the comparative method. Although there are obviously distinct cultural viewpoints, there is of course still much overlap, or given, when we come to compare societies and cultures with one another. In terms of the generalizing objectives of social anthropology, it is this area of the given, which must serve as a fundamental building block to theory.

By HANS G. MUKAROVSKY

A. E. Meussens' article "Lexikostatistiek van het Bantoe: Bohangi en Zulu," published in Kongo-Overzee (1956), should have been quoted, and would have given some insight on possibilities of estimating time-depth in the Bantu area.

Reply

By D. H. HYMES

I am grateful to Hewes for pointing out that the concept of a glottochronology has a greater time depth than had been realized, and for extending my awareness of the history of anthropological thought. Certainly Latham's "Apophthegm" does point to glottochronology more than the sentence quoted from Sapir's *Time Perspective*. It remains that Sapir's statement is known to be that which inspired Swadesh to develop the method (or, which Swadesh took as his motto). Whether or not behind Sapir's statement there lies an awareness of Latham's insight, I cannot determine. In the context of his time-perspective essay, Sapir probably would have delighted in suggesting the possibility of such a precise linguistic contribution. Also, his statement is one that could reasonably be derived from the historical interest and linguistic knowledge we know him to have had, and, indeed, the notion that greater differentiation implies greater time depth probably can be traced well back in evolutionary thought. The notion is not stated as a general principle, but clearly assumed, in earlier Americanist work. Thus Mooney wrote, "Although the territories held by the several Iroquoian tribes were not all contiguous, the languages, with the exception of that of the Cherokee, which presents marked differences, are so closely related as to indicate a comparatively recent separation" (1894:5). I suspect independent origin, Latham's "Apophthegm XXXIV" being an instance of the potent idea that fails to find fertile ground.

Dmitri B. Shimkin has prepared a lexicostatistic study of certain Siberian languages, and this includes an analysis of the mathematical foundations of the method. I have not seen the manuscript.

Fred W. Householder, Jr., points out the desirability of providing a grounding for the basic vocabulary lists which will fit them better than the sources consulted for Table I of the paper. Householder is inclined to think three factors may be involved: "early learning (for which really exhaustive rec-

ords of children in the first year of speaking would be helpful), frequency of use (spoken, written, and thought, of which the last is unfortunately not accessible), and conformity to normal 'canonic' phonemic shape—which cannot in itself be predicted from the list." This last point, the effect of a language's typical patterns for the shapes of morphemes, has not been raised before.

David D. Thomas (1960) has published a particularly interesting discussion of the persistence of basic vocabulary items in some Mon-Khmer languages. He concludes: "(1) that the individual items vary greatly and unpredictably in their persistence, and (2) that the semantic groups are surprisingly unvarying in their average persistences." By far the majority of semantic groups (as classified by Swadesh [1955]) show less than 10% difference in average persistence of the items within them when the largely Indo-European sample of Swadesh is compared to these languages of south Vietnam. Thomas thus highlights the importance attached to semantic groups in my paper; suggests a stability for such groups not anticipated there; and reports individual items of cultural interest (thus, "black" is markedly less stable than other color terms in Mon-Khmer and than all color terms in Indo-European, while "vomit," one of the least stable items in the body sensations and activities group in the Swadesh sample, is one of the two perfectly stable such terms in Mon-Khmer (19% : 100%).

Thomas had data which provided, not all, but most of the items studied by Swadesh. Lacking records for earlier stages of the languages, he could not, as could Swadesh, score persistence directly by a linear comparison, and so he devised a special formula to estimate relative persistence:

$$\tfrac{1}{2}\,\frac{(n-1)+(p-r)}{(p-1)},$$

where p is the number of words in a given comparison (i.e., of dialects or languages containing equivalents for the particular test-list item), r is the number of different roots occurring in this set of equivalents, and n is the highest number of occurrences of any one root as an equivalent within the set. Unfortunately the formula is scarcely discussed in the published paper, and so some comment is needed here. Note that when r is 1, the formula yields a persistence of 1. The formula is such that persistence varies directly with n (n can vary from 1 to p, and, the more closely it approaches p, the higher the persistence score for the item); that persistence varies inversely with r (r can vary from 1 to p, and, the more closely it approaches p, the lower the persistence score for the item); and that persistence varies usually inversely with p (the larger the size of p, the larger the numerator, to be sure, but, also, the larger the denominator—and this divides not only $[p-r]$, which cannot be greater than $[p-1]$ and may be smaller, but also the unchanged $[n-1]$). On this last point, the formula assumes, in effect, that proportionate decrease in n is somewhat more significant in measuring persistence than proportionate decrease in r. In the special cases where n has the maximum value allowed by r (and r is not 1), the formula reduces to $(p-r)/(p-1)$, and the persistence score for the item varies directly with p. (The two variables n and r are not independent, in that the maximum for n is $[p-(r-1)]$, that is, n has its upper limit set inversely by the size of r.)

This persistence formula may contain assumptions other than those rapidly noted here, and it may also be that Thomas has tried other formulas for the purpose and found them wanting. Certainly the formula should be applied to control cases in order to see how closely it does in fact approximate true persistence scores. If the approximation is satisfactorily close, Thomas will have provided us with a significant new tool. This whole question of the stability of the relation between meaning and form, between *signifié* and *signifiant*, is of great methodological interest for glottochronology and of great theoretical interest for general linguistics and culture theory. We have no satisfactorily detailed and fully attested studies. In this regard it is particularly unfortunate that Thomas' data can only be consulted at the University of South Dakota or in Saigon. It can help provide just the sort of cross-cultural test which is requisite. Since Thomas' paper appeared in *Anthropological Linguistics*, a journal which has as one of its chief and unique virtues that it publishes such sorely needed basic data, let us hope that a future issue will contain his lists. The sad scantness of published basic data for many problems in lexicostatistics was pointed out in my article.

O'Grady provides a valuable battery of examples pertaining to one of the main problems not yet resolved in the application of glottochronology, the specification of operations for adapting the test-list, if need be, and for choosing equivalents to its items when alternatives are presented. The bulk of his examples, however, have not been pertinent to the diagnostic test-list since 1955, and, indeed, his material confirms Douglas Taylor's observation that the 100-item diagnostic list now in use is superior in terms of semantic usability to the 200-item list which preceded it.

With regard to O'Grady's category (1), none of these nine concepts appears on the revised 100-item list. Eight have been relegated to the supplementary list, and "count" has been dropped altogether. Regarding (4), neither "lake" nor "sea" appears on the 100-item list. ("Claypan" seems a good substitute, were a supplementary item needed in Australian applications. In this connection, see p. 17 of the article, and the proposal by Donald Stanley Marshall there quoted.) Regarding (5), two of these are not retained at all ("because," "some"), two are relegated to the supplementary list ("dirty," "few"), and only "all" remains on the diagnostic list. As for "all," if "especially difficult to elicit" does not imply the absence of an equivalent, then it is not strictly a valid criticism of the item. It would be interesting to know what methods succeed in obtaining the native equivalent for "all," and what methods fail. Regarding (6), 16 of the 25 items cited have been relegated to the supplementary list, and two are not retained at all, while seven remain on the diagnostic list ("dry," "know," "man," "many," "person," "stand," "yellow" [also "egg"]). The suggestions for specification of the semantic range of these items seem apt. Since the need for such specification is a central problem in need of prompt solution, I should like to quote Douglas Taylor (personal communication) on it:

> It would be interesting and useful, I think, to see just what substitutions Morris himself—and others—would make when filling in the test-lists for the language of the glosses (Spanish and English); and I do wish that he would publish or approve a four-language list of glosses. To what extent do people likely to use this method disagree on what is 'the common, everyday word,' in their own mother tongue, for this or that, and what is 'the central meaning' of any particular gloss on the present lists? For example, I understood his 'embotado—dull' only because of the Spanish. The antonyms are, for me: dull/bright (weather, people) and blunt/sharp (knife, weapon, instrument)—also hot/cold and warm/cool (now corrected, but earlier given as warm/cold). Similarly, "fat (n.)" seems a better gloss than "grease" (the latter word makes me think of axle-grease or dirty rags). And in the case of "vereda-path," I should like to know what French (sentier? trace? chemin?) and German (Pfad? Fussteig? Weg?) equivalents he would use (1) as gloss and (2) as "translation." In primitive cultures there is probably only one common word and one common thing; but elsewhere, words like "vereda, path, sentier, Pfad" are today rather too specific, and others like "camino, road, chemin, Weg" are perhaps commoner, while still being non-commital as to the type of road meant ("a farm road," "road to Mandalay," etc.). Spanish carne is ambiguous, but English meat and flesh are not (meat 'viande,' flesh 'chair'). Why then has Morris wavered between the two? He cannot get both meanings with one gloss except for such languages as do not make this distinction.

It seems as if he also wanted two words for one gloss with his "uña—claw" (Fr. ongle or griffe?) and "pelo—fur" (Fr. poil or fourrure? English fur or body-hair?) These things should be made clear on the lists themselves—either by multilingual glosses or otherwise.

Difficulties due to the semantic pattern of a particular language cannot, of course, be foreseen; but may sometimes be resolved by common sense. For example, Island Carib has two words translatable by "ear": one meaning 'organ of hearing' and the other 'the external appendage called "ear" '; but only the latter is at all common (and is also, I should think, the more common referent for our 'ear'). More doubtful is what to put in Island Carib for 'pierna—leg.' There are three words meaning specifically: 'shin (leg from ankle to knee)'; 'thigh'; and 'hip.' The first is referred to most often; but only the last is used in reference to the whole leg. In Lokono there is one word for 'wing or forearm,' another for 'upper arm or shoulder.' On the whole, the supplementary list is much more difficult to translate than the 100-word list ('lavar—wash' should specify clothes or the body; it makes a difference in Island Carib as well as in Dom. Fr. Creole). Moreover, items like 'ice, snow, freeze' are highly cultural in tropical countries, where they often yield only loanwords or nothing. I should think that alternative glosses of equal frequency might be found for such tropical cultures; what about: bat (quadruped), chew, float, honey, woods (forest)?

With regard to Taylor's instructive remarks, and O'Grady's category (6), as well as to Sarah Gudschinsky's comments to the original paper, it is not a question of the usability of the items so much as a question of improving their application. This latter is not only a great need in lexicostatistic work, but also would be of interest in shedding light on semantic structure in various languages, and possibly in revealing a few semantic universals or widespread trends. What is needed is the bringing together of a broad body of empirical material, and the devising of complete and explicit rules on the basis of this material. As a first step, I should like to invite readers of CURRENT ANTHROPOLOGY to communicate to me the specifics of the application of the test-list to languages known to them. By "specifics," I mean information on such points as the complete absence of a possible equivalent for a test-list item; possible alternative equivalents for a test-list item; the precise reference and/or grammatical status of such alternatives; if possible, glosses in European languages which would clarify an item; the alternative they would prefer if forced to choose, and the supporting reasons; and likely substitute terms for particular areas. I would call attention to the particular kinds of problems and solutions discussed for Athapaskan on p. 16 of the original article. H. A. Gleason is at work on a much longer list, whose suitability for various culture areas he is seeking to determine. By pooling the experience of a number of scholars in various parts of the world, and by informal consultation among Swadesh, Gleason, Taylor, Gudschinsky, and any others who are interested, it should be possible to devise a multi-gloss list with rules of application adequate to meet all but the most unusual situation.

To return to the details of O'Grady's examples: regarding his category (3), only one of the four examples involves two items both on the diagnostic list, namely, "red" and "blood." (Indeed, "now" and "from" were never on either the 200-item or 100-item lists, so hardly could cause difficulty as components of expressions for "new.") "Red" : "blood" might indeed require substitution of another item for one of the two, but see my remarks to follow in discussing category (2), to which I now turn.

With regard to (2*a*), three of the fourteen sets of problems are given as illustrations, since "dew," "tell," and "shoot" are not on the lists. Two other sets pose no problem because one member is not retained in the 100-item list ("scratch" vis-à-vis "dig," and "think" vis-à-vis "hear"). In two other sets, both members are relegated to the supplementary list ("husband, wife" and "at, in"). In three other sets, only one of the members is on the diagnostic list ("fruit" is on the supplementary list vis-à-vis "edible roots, etc." and "hit" and "stab" vis-à-vis "kill"). This leaves four cases in which one of the Australian concepts involves more than one item on the diagnostic list: "bird" : "meat, flesh"; "stone" : "mountain"; "walk" : "fly, swim"; "lie" : "sleep." Unfortunately the actual forms are not given. Is the listed Australian concept the volunteered translation meaning for an Australian lexical item? Is it the meaning inferred by the investigator to cover the range of uses of a (simple or complex?) lexical item? Is it the meaning abstracted from partly different, partly similar, lexical items and attributed to their common root? Perhaps it cannot be the last, given category (3). But since category (3) is specified as dealing with compound and reduplicated equivalents, we are left to wonder about the possibility of forms which share a morpheme or more, but differ inflectionally or derivationally, or as lexemes which structurally are phrases (this is suggested by the form cited in n. 5: Nyaŋumada pani).

Swadesh's original instructions for filling out the test list speak of obtaining the common, everyday equivalent for an item; these instructions do not specify the grammatical status of the equivalent, and do not rule out the possibility of anything from a root through an inflected word to a syntactic phrase. In my present view, one is dealing with idioms in the sense defined by Hockett (1958)—forms whose meaning (here tapped by the test-list gloss) is not predictable from any component forms. A test-list equivalent may thus be a single morpheme or more. It is common practice to abstract from inflectional apparatus which makes no contribution to the range of meaning that is being tapped by the test-list gloss. But if a compound or even, syntactically, a phrase remains, that is that. And if cognates to such a compound or phrase recur in related dialects and languages, and especially if such a compound or phrase must be reconstructed as the equivalent of the test-list item to the parent language, I see no objection to counting it as a retention in each dialect in which it occurs—to scoring it as a glottochronologic same. Moreover, I believe it possible not to object to such an idiom's repeating morphemic material found elsewhere among the equivalents to the list. If criteria of persistence, etc., pointed to its desirability as an item, "rainbow" could well appear beside "rain"; if the historical facts were of the sort described, there would be no glottochronologic reason not to count both independently as retentions or glottochronologic sames.

Thus we need to know the Australian forms which are the equivalents for the test-list items "bird," "meat," "stone," "mountain," "walk," "fly," "swim," "lie," "sleep," before the problem posed by O'Grady for the Australian application of the list can be fully discussed. But, assuming for the moment that the items are unusable, the problem is manageable in size. There remain a large number of supplementary items from which to choose the four or five substitutions necessary.

Turning to O'Grady's category (2*b*), we find that, of the seven items in Table 2, three ("rope," "rub," "old") are relegated now to the supplementary list, while four remain on the diagnostic list. O'Grady's listing suggests that he places on the left-hand side the choices he thinks preferable; if so, I find myself generally in agreement. "Come (imperative)" seems a good choice among moods; cf. the problem in Navaho for "walk" and "come" (p. 16 of the original paper). As to "fruit seed," it is necessary to know the components of Nyaŋumada pani. "Old" in reference to "thing" is the best choice clearly; "to rub *in*" seems good; for "rope," "sinew/string" seems the more obvious choice; "native" as opposed to "European" seems always the obvious choice.

As to the proliferation of Australian terms for "sand," only a knowledge of the languages and cultures involved can provide the basis for the best choice among them. An arbitrary choice is always possible, but it is possible also

that one of the terms is in fact to be preferred as denoting *sand* typically in contrast to other things, as *sand* par excellence. Such vocabulary sets often are organized hierarchically, such that the same form functions on more than one level of generality; the absence of a name which uniquely denotes the more general category does not mean that no name for the category exists. Thus, while English has a special name, "fish," of which "salmon," "trout," etc., are kinds, Chinookan does not. There would seem to be only names for particular kinds of "salmon," "trout," etc. Yet when it is not necessary to specify a particular kind of fish, or when fish are being talked about in general (in implicit contrast to non-fish), the form for "Chinook salmon" (stem: *-gunat*) will be used, for it is *fish* par excellence. One of the Australian terms for kinds of *sand* may have a dual role like that of Chinookan *-gunat*, of the form for "cottonwood" in many languages of the American Southwest (denoting both a kind of tree and *tree* par excellence), or "man" and "animal" in English ("man" vs. "woman," "man" vs. "animal," "animal" vs. "vegetable" vs. "mineral"). In the terminology of some linguists, such a form is the *unmarked* term: it can stand for the category as a whole in situations in which no contrast within the category is being made. In completing the test list, unmarked terms should be sought and, if found, chosen, in cases such as that pointed out by O'Grady.

Part II of O'Grady's comment is not relevant. Semantic shift among the items of the list is simply one of the ways in which the approximately 14% of change per millenium takes place.

In sum, while many of these Australian examples merely duplicate those which led to the 1955 revision of the test list, all are interesting and some very helpful and instructive. It is the accumulation of just such information, backed by the actual forms of the languages involved, which must be appealed to if the semantic odds and ends in applying the list are to be tidied up.

I agree with Cohen that the existence of universal ideas or meanings, and the comparability of different societies, are two distinct questions, and I am sorry to seem to have mixed them, since I did not intend to raise them. Nor did I intend the chain of inference ascribed to me—from the number of test items found glottochronologically universal, to the number of universal ideas, to the relativity of social worlds. The general difficulty is that Cohen takes me to be discussing elements, whereas I wrote in the context of the concept of pattern or structure. In the paragraph preceding that which he quotes, I denied that items of basic vocabulary participate in identical semantic patterns in all languages. If any further demonstration is needed, O'Grady's comment and the remarks of Taylor may provide it. The fault may lie with my wording: "Within the sphere of such meanings (i.e., universal items of basic vocabulary), it is clear that Hjelmslev and others are correct in rejecting any assumption of a *set* of pre-established universal ideas or meanings for which different languages merely have different tags." The term "set" carried for me the notion of contrast of the members within it, i.e., a structure or, better, system, and I denied and still deny, however many universal meanings there may be, that they form a universally occurring system.

From this I came to Sapir's dictum, and my reference was just that which Cohen indicates, "this *organization* [emphasis mine] of the world view which underlies the meaning-set of lexical items and accounts for the difficulties of translation." From this it does not follow for me, nor did it for Whorf, that there can be no comparison of peoples whose semantic patterning of the world differs. On a very specific level, many individuals within the same society differ among themselves in the semantic structuring of their common social world. To some extent these differing semantic patterns may mold the social worlds of their holders, but to an important extent they also engage and are molded by those worlds. (See now the discussion of Sapir's dictum in Hymes 1960:84.) Cohen ends by stressing the given, and this is an important perspective, but linguistics, and, I should maintain, cultural anthropology generally, must deal in comparative work first with the ways in which the given is organized by a people, that is, with *emic* perspective rather than an *etic* one, to use the useful terms of Kenneth Pike. Linguistics happens to deal with a part of culture which has fairly readily yielded secrets of its internal organization in recent years, and so linguistics has a fairly well-developed way of discovering and dealing with systems of functionally interrelated parts, whose structural relevance is that guaranteed by the purposive behavior of the people studied, not something entirely imposed by the investigator. Meaning is structured, and studies such as those of Martin Joos, Einar Haugen, Harold Conklin, Ward Goodenough, Floyd Lounsbury, Anthony F. C. Wallace, Charles Frake, and others, are uncovering the ways. So is culture structured, and all the projected "given" in the world will not buy an atom of a fundamental building block for a theory about culture (as opposed to theories about something else). Sapir's thought has been criticized by Marvin Opler for stopping short with cultural structure, symbolic organization, and for not placing it in the context of the given, of ecological adjustment, evolutionary adaptation, and the like. The criticism is just. Some linguists today stop with the internal structuring of language, and do not place it in its context of use and variation as it adjusts and adapts to its cultural and non-cultural environment. But nothing cumulative or worthwhile can be done with the problems of the variation and social function of speech, if the internal structure of that which varies and functions remains unknown. And so it is with culture generally. There are of course many similarities between societies, and for many purposes a rough-and-ready approach can assume them. But this is hardly the touchstone of a science. I would maintain that the basis of a rigorous comparative method is not a projected given, but the structural description of the units to be compared. One need not stop with the individual systems, but one must pass through them. As Sapir showed in "Sound Patterns in Language" (1925), sameness and difference are, in culture, not a matter merely of sameness and difference in inventory (as Cohen's last paragraph seems to assume), but very much a matter of the way in which an inventory of elements is patterned, of contrast within frames, of contexts of relevance. And calling something a "pattern," "structure," or "system" does not make it one. "Structure" or "pattern" is not just a handy name for an observer's generalization, and "system" is not just a prestige term for a chunk of culture. That these terms apply has to be shown. I write at this length because I believe that if there is any one way in which linguistic work can repay the rest of anthropology, it is with discussion and understanding of what it means to be, in the true sense of the terms, a "cultural system."

Wilhelm Milke has very kindly communicated to me some new calculations for Athapaskan which are prompted, he writes, by my comments on his 1959 article. I must simply report them here in the terms of that article. The great interest of Milke's work is that he experiments with formulas and calculations based on varying assumptions about the historical process being measured. The first new Athapaskan calculation assumes that the N(orthern)- and P(acific)-elements go back to the proto-language but that the S(outhern)-elements are new acquisitions of the Southern (Apachean) group. The results (presented in new tables 5*a*-8*a* which, together with those to be mentioned below, I would be glad to communicate) are judged not very satisfactory, espe-

cially since the average difference between the new values for P_i and P'_i are greatly increased, and the correlation of both noticeably lessened. The distribution of P_i is just as skew as in both earlier calculations, but in the opposite direction. Guided by this, Milke has averaged the P_i and P'_i values of the old and new calculations, which is equivalent to the assumption that half the N- and P-elements go back to the protolanguage. The new values (presented in a new table 5*b*) are such that those for P_i distribute in good approximation to the binomial theorem; the other results are presented in new tables 6*b*-8*b*. The effect of the differing assumptions on the time depths is comparatively slight, and of real significance only for the time depths within the Northern and Pacific groups. In any case the exceptions taken on principle about unreduced words at the conclusion of the 1959 article are, Milke writes, upheld ("Die zum Schluss meines Artikels angedeuteten prinzipiellen Abweichungen gegenüber den unreduzierten Werten bleiben in jedem Fall erhalten").

With regard to this now much-discussed case, it is important news that the chronology of the Athapaskan languages has been redone by Hoijer (personal communication): "The addition of some twelve northern languages gives considerably greater time depth—2500 years as compared to the 1500 of the original article. The greater distances come in relation to the Alaskan languages and particularly Tanaina."[8] This conclusion goes together with that of a study of the Athapaskan numeral systems (V. Hymes 1957) and a study (unpublished) of the Athapaskan kinship systems recently made by Aberle and Dyen, both of which indicate the north as the area of greatest Athapaskan divergence. All this again shows how one must evaluate the results of historical linguistics against the sampling which underlies them, and how essential to our penetration of the past (and formulation of regularities of change) is the recording of as full a range of dialects as possible. The next step in Na-Dene should be the basic descriptive work which is its *sine qua non*. The Summer Institute of Linguistics fortunately is providing data for some of the poorly known northern Athapaskan languages. A thorough study of Haida is critical, since the language may soon be gone, and a fresh study of Tlingit, synthesizing as well the earlier work of Swanton, Boas, and Velten, is highly desirable. Such studies, together with Li's Eyak material and the comparative Athapaskan dictionary which Hoijer is completing, can sustain a comparative Na-Dene which in turn can give anthropology an unusually productive and satisfying result: a laboratory for studies of method, a series of New World conclusions of great interest, and the prospect of carrying this New World relationship soundly into the Old World.

In the original paper I wrote that the possible fit of Swadesh's new estimate of 46 centuries minimum divergence time for Eskaleut with archaeology had not been stated in print. W. S. Laughlin calls my attention to his article, "Neo-Aleut and Paleo-Aleut Prehistory," and points out that where he refers to 4000 years, he means four thousand years of occupation at Chaluka, specifically disavowing any suggestion that this is the earliest Aleut occupation. New carbon dates for Kachemak Bay add confirmation to the hypothesis of the origination of Eskimo-Aleut culture in southwestern Alaska, and Laughlin states that on balance he is pleased with the congruence between the linguistic, physical anthropological, and archaeological evidence in this case.

Shirō Hattori's proposal for adjusting calculation of time depth was a major point of discussion in the original article, and Hattori was one of those who contributed comments to it. I can now say something about other of his studies, thanks to his kindness in sending me reprints of three of them, and to Maner Thorpe for calling my attention to another. I am indebted to Thorpe for providing an account not only of the content of the Japanese text, but also of the context of its significance.

Hattori (1953) had found the Shuri Okinawa dialect to be much closer in time to mainland Japanese than fitted the conceptions of many Japanese scholars. In "Glottochronological Study on Three Okinawan Dialects" (1955), he implicitly counters doubt by showing that the same relative closeness obtains for other dialects as well, and that some other Okinawan dialects are in fact closer to Japanese than is Shuri. This article is also of great methodological interest, in that Hattori presents the data fully, with a refined notation for the historical status of the individual forms, such as: clearly a cognate retention, borrowing from one of the dialects by another, sharing of a loanword from another language altogether, doubtful, or clearly non-cognate.

Hattori (1953:72ff.) also provided a comparison of Mongol languages using the 200-item list. The percentages of cognates and the main sources utilized were given in English as additional remarks sent to the First International Congress of Mongolists-Philologists (September, 1959) in a later paper by Hattori (1959:54). He thinks it probable that Monguor was separated from the other dialects before the thirteenth century. Some of his data are from unpublished sources through work with informants (for Dagur and Chakhar) and correspondence with Rev. Antoine Mostaert (for Monguor forms), and we may hope that it will be made available.

Maner Thorpe has made a number of glottochronologic counts in connection with his study of comparative Altaic, Japanese, and Korean. (The sound-correspondences underlying the judgments of cognation have in many cases had to be freshly determined.) The main trends of his results are to confirm Chuvash as most divergent within the Turkic branch, with a minimum estimate of Turkic time depth as about 2000 years; and to show the time depth as between Tungus and Turkic, Mongol and Turkic, and Mongol and Tungus, to be consistently about 6000 years. This is perhaps a remarkable depth, considering that the Altaic relationship was noted correctly by Castren in 1830.

In a paper called "The Dialects of the Amami-Ōshima Islands," Hattori records the occurrence of equivalents for 34 lexical items in many parts of these Ryukyus islands (in geographical sequence, the main dialects treated are Aden, Naze and Shodon [on the same island], Kamezu, Tetechina, Chahana), and he also maps clearly the distributions for some 18 points of dialect difference. (This work is a great advance in Japanese dialectology for the area, which has usually been limited to curiosity-collection.) These mainly phonological features seem by inspection of the maps not to yield any clear division, but often to set off the ends of the chain (Aden; Tetechina, Chahana) either singly or jointly against the middle (Naze and Shodon, Kamezu). Another paper by Hattori, "A Glottochronological Study of the Dialects of the Amami-Ōshima Islands," gives a fuller and clearer picture. All the dialects are rather close, but, within the range, Chahana is most apart from the rest, Tetechina somewhat less apart, Kamezu middling, and Shodon, Naze, and Aden most a close-knit group. (A rank-ordering of shared percentages gives: Naze-Shodon [91.0], Aden-Kamezu [90.9], Aden-Naze [90.8], Aden-Shodon [90.4], Shodon-Tetechina [90.2], Aden-Tetechina [90.1], Kamezu-Tetechina [89.6], Tetechina-Chahana [89.4], Shodon-Kamezu [89.3], Naze-Kamezu [89.2], Shodon-Chahana [88.8], Naze-Tetechina [88.3], Aden-Chahana [88.0], Kamezu-Chahana [87.8], Naze-Chahana [87.0].) This paper is quite as thorough as that of 1953, repeating Yonamine,

[8] This fits easily within Swadesh's estimate (1959) of 5000 years minimum divergence time for Tlingit-Eyak-Athapaskan (within a Na-Dene of an estimated 9000 years).

Shuri, Tokyo, and Kyoto from it, and adding Kagoshima, a city on the southern Kyushū coast. Only the items of the revised 100-item diagnostic list are scored, leaving cognation in doubt in certain delicate cases outside this list. Again, not all dialects are used in the scoring, since several are judged too close to warrant it (thus Yō, Agina, Kominato, Ishīwara, Tojen, Hirada, and Koninja are not scored for any items, Naze being taken as representative of this group). The scoring shows a few changes from the 1955 paper, toward greater accuracy, and the notation is slightly changed. The results in outline show Tokyo and Kagoshima at 85.1%, which is about 10% more shared retentions than either has with any of the Ryukyus dialects. Their percentages of shared retentions with the Ryukyus dialects range between 70.9% and 76.4%, with Kagoshima usually but a percentage point or two closer than Tokyo. The Ryukyus dialects stand apart as a whole from mainland Japanese. Of the dialects reported here, Shuri and Yonamine (both on Okinawa) of course are very close to each other (94.7%) vis-à-vis the Amami-Ōshima group, with which their shared-retention percentages range between 83.7% and 88.3%.

That so much must be added to a review of lexicostatistics but a few months later shows, I think, the vitality of the subject. The original article covered so many points that I would like to restate here the main conclusions: (1) glottochronology and lexicostatistics enjoy a fair amount of theoretical and empirical support; (2) applications now can be of value both for historical and methodological conclusions; (3) a painstaking re-testing of the basis of glottochronology in the control cases, and a painstaking analysis and synthesis of the semantic problems in its application, are greatly needed. My main hope is that the subject can now be considered apart from partisan controversy and individuals, and that the potential contributions to general theory and knowledge of human history are clear enough so that the research needed to realize this potential will be undertaken.

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OUR READERS WRITE

(*Continued from page 306*)

A résumé (the entire work is too long for CA) of BONČ-OSMOLOVSKIJ's monograph on Neanderthaloid specimen from Kilk-Koba (Crimea). The monograph is in Russian. (England)

An outstanding theoretical-methodological paper . . . is TOKAREV's on "Ethnogenesis," which appeared in *Sovetskaia Etnografiia* [1949] No. 3:12–36. This could be read with profit by many of our colleagues, as well as exemplifying the best Soviet scientific thinking. Tolstov's "Forty Years of Soviet Ethnography" in 1957, No. 5, of the same journal . . . is packed with extremely useful information on the organization, activities and publications of Soviet ethnography, past and current. I think it would be worth while having it translated. (U.S.A.)

. . . an article by D. A. OLDEROGGE . . . published as the lead article in *Sovetskaia Etnografiia*, January, 1958, pp. 3–10, on the revaluation of Lewis Henry Morgan in the light of current Soviet research. (U.S.A.)

Finally, two Associates gave advice on how to select articles:

Use *Review and Newsletter—Transcultural Research in Mental Health Problems* as a guide for selecting difficult to find but valuable articles. (U.S.A.)

Since CA will be published in English, I would urge that each number reprint translations into English of the best article appearing during the previous six or twelve months in a foreign language—i.e., we would have a nomination from each major country or language area, taking these in rotation. That is, say, let Scandinavians select an article in Danish, Swedish, or Norwegian for one number. Next, take a Russian selection, then a Japanese, etc. This would mean that local or national Associates in each country would select their best, but without competition between countries. This would give us all a good sample. (U.S.A.)

Language and Style

Another question recently raised with Associates was that of the propriety of the present solutions to problems of language and style for CURRENT ANTHROPOLOGY. Most of the 101 replies support the present policy, but certain decisions drew criticism, and several new issues were raised.

Language

Although publication in a single language, and specifically in English, is generally—if often reluctantly—accepted as the most practicable expedient, ten Associates strongly opposed this decision. Four members of this group live in the U.S.A. Of the European dissenters, two were from France, one from Germany, and three from Sweden. Half of these urged publication in French as well as English; the rest would have CURRENT ANTHROPOLOGY accept any language, or simply objected to English without suggesting alternatives.

Abstracts

Closely related to the problem of language is that of printing abstracts of review articles. Ten Associates have urged CURRENT ANTHROPOLOGY to adopt this practice. Two of these would have the abstracts in English, as a convenience to the reader. Several Associates suggested abstracts in French, German, and Spanish, or in one of these; one added Chinese and perhaps Arabic; and one person recommended interlingua.

Style

The present compromise of using American English for news and editorials, but allowing authors to use either British or American style, was endorsed by most of those who replied. A further indication of this policy's success is that those who urged the exclusive use of one style or the other did not choose chauvinistically. Only five Associates preferred American style alone; one of these lives in the U.S.A., the others in Austria, England, Germany, and Spain. The single person who wanted British style used throughout CURRENT ANTHROPOLOGY is an American.

Besides the six persons who preferred a particular style of English, four Associates suggested (correctly) that a single uniform style would be easiest for the editorial staff.

The archeology-archaeology controversy, which has drawn several letters in the past, was raised again by three Associates. One wanted "archeology," one "archaeology," and the third suggested this issue would never be resolved.

Three new recommendations were made: (1) that notes be printed throughout the article as footnotes, rather than in a separate section at the end; (2) that CURRENT ANTHROPOLOGY use the metric system for weights and measures; and (3) that periods be omitted in abbreviations. The first suggestion has been adopted; the second and third are still being considered.

Place Names

A note that CURRENT ANTHROPOLOGY could adopt a policy of not Anglicizing place names drew objections from a number of Associates. Typical replies were:

If we are bound to read English, let us at least have proper English . . . not mixed with foreign names, even if these are place names. Of course, this does not apply to isolated names, such as appear in the price list. In any case, perhaps the problem of language might not be considered solved once for all? (France)

Place names should be chosen for most widespread recognition. (U.S.A.)

Although the use of native forms for the nations included in the price list on the back cover of CURRENT ANTHROPOLOGY was generally accepted, there were several criticisms of the present list. Two Associates (U.S.A.) wanted native forms used for all the countries listed. Two Associates, of whom one lives in the U.S.A. and the other in Malaya, questioned the use of "Bharat" rather than "India"; and one person (U.S.A.) wanted "Nihon" substituted for "Nippon."

Misspelled German

We are deeply embarrassed to find that the spelling of German words in CURRENT ANTHROPOLOGY is very bad, and apologize. At fault are neither our excellent printer nor proofreaders in our office. They follow the manuscript which is provided. The responsibility is the author's. Since we publish in English, the misspelled words in German (or other languages) are mostly in titles of publications. Our office staff may notice errors in bibliographic items and call them to the author's attention, but we *must depend on the author for the accuracy of his information* because (1) time and resources in the editorial office are limited; (2) the original books and articles are frequently not available for checking; and (3) the editorial staff cannot control all languages even enough to *question* the spelling. The author presumably has seen the originals of the books and articles he refers to; only if he records them accurately in his manuscript can they be accurate in print.

Erratum: Vol. 1, No. 3, May, 1960, p. 257. Irving A. Rouse, who was awarded a Viking Fund Medal for 1959, is Professor of Anthropology at Yale University.

SUPPLEMENTARY LIST OF ASSOCIATES through April 20, 1960

See Volume I, Number 2, for an explanation of the entries and a key to the abbreviations used.

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ADANDÉ, ALEXANDRE. Chef, Dépt. d'Ethnog., Inst. Fr. d'Afrique Noire, Dakar, Senegal, W. Afr. Ethnog., Afr. art. W. Afr., esp. Dahomey. **F**

AGONCILLO, TEODORO A. Prof. Hist., U. Philippines, Diliman, Rizal, Philippines. Prehist., ling., Tagalog lang. & lit. Philippines. **O**

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BOWLES, GORDON T. Visiting Prof. Anth., Dept. Anth., Columbia U., New York, N.Y., U.S.A. Comp. ethnogr. & relative significance of soc. insts. & soc. controls in determining man's biol. behavior as an interbreeding animal. Determination of gene pools & the degrees of effectiveness of sex regulations, rules of endogamy & exogamy, degrees of their observance & non-observance & their significance in determining man's heredity. India, Indo-Tibetan & Sino-Tibetan borders, Japan, Korea. **A**

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MOHR, RICHARD JOSEF. Mt. Franckenstr. 12, Nijmegen, Netherlands. Prof., Dir. Inst. of Cul. Anth., Roman Catholic U. Ethnol., ethnogr. Relig. & sociol. W. Afr., esp. Ghana, Nigeria & Haute Volta. **F**

MOLINA ORANTES, ADOLFO. 13 calle 6–47, zona 1, Guatemala City, Guatemala. Mem., Board Dirs., Inst. of Anth. & Hist.; Dir., UNESCO Natl. Commission. Soc. integration in Guatemala. Guatemala **S**

MORIN, ALEXANDER J. 1360 E. 58th St., Chicago 37, Ill., U.S.A. Pres., Quadrangle Books, Inc.

MORSE, PHYLLIS ANDERSON. Arch. Georgia Historical Commission, 116 Mitchell St., Atlanta 3, Ga., U.S.A. Arch., cul. theory, lab. techniques in arch. S. E. U.S.A. arch., protohistoric s.e. ethnogr., statistical techniques in anth. E. & S. E. U.S.A. **N**

MURRILL, RUPERT IVAN. Ac. Prof., Dept. Anth., U. Minnesota, Minneapolis, Minn., U.S.A. Phys. anth., Human racial adaptation, paleoanth. **W**

N

NAGAI, MASAFUMI. As. Prof., Dept. Anat., Kyushu U., Fukuoka, Japan. Phys. anth. Studies of prehist. Japanese; somatological investigation of the pops. of S. E. Asia. S. E. Asia, esp. Loochoo Is. **A**

NEMESKÉRI, JÁNOS. Dir., Anth. Section. Mus. Nat. Hist., Bajza-u. 39, Budapest 6, Hungary. Phys. anth., Paleodemography, hist. anth., paleopath. Mid. Danube Basin. **E**

NEDO, PAUL. Rapunzelweg 7, Leipzig S. 3, East Germany. Dir., Inst. für Volkskunstforschung. Ethnogr. & folklore. Europe. **E**

NEUMAN, ROBERT. Arch., Smithsonian Inst., 1517 "O" St., Lincoln, Neb., U.S.A. Arch. & geog. (cul.). Plains. **N**

NEWMARK, LEONARD. 5830 Granby St., Worthington, Ohio, U.S.A. As. Prof. English, Ohio State U., Columbus. Ling. Grammatical theory, applied ling. (esp. lang. teaching). Albania. **E**

NOBACK, CHARLES R. Ac. Prof., Dept. Anat., Col. of Physicians & Surgeons, Columbia U., 630 W. 168 St., New York 32., N.Y., U.S.A. Phys. anth. Primate nervous system.

NUNOO, RICHARD. As. Cur., Ghana Mus. & Monuments Board, P.O.B. 3343, Accra, Ghana. Arch., ethnol. Neol., Iron Age and protohist. of s. & Ashanti regions of Ghana. W. Afr. **F**

O

OKOJIE, CHRISTOPHER G. Med. Dir., Zuma Memorial Hosp. Irrua, Benin Prov., Nigeria. Afr. customs. W. Afr., Nigeria. **F**

OLIVER, CHAD. As. Prof., Dept. Anth., U. Texas, Austin 12, Tex., U.S.A. Soc. anth., ethnol. Sociocul. evol., cul. ecol., gen. soc. org. Plains Indians. **N**

OSWALT, WENDELL H. Instr., Dept. Anth. & Sociol., U. California at Los Angeles, Los Angeles, Calif., U.S.A. Amer. Indian cul. anth., arch. Cul. change. Arctic. **ARCTIC**

OWEN, TREFOR M. As. Keeper, Welsh Folk Mus., St. Fagans, Cardiff, Wales. Folk-life studies, soc. anth. Rural comms., folk customs, domestic architec. Eur., esp. British Isles & Scandinavia. **E**

SHIGEO OZAWA. 29-401 Higashifushimi-Kōdan, Kitatama-gun, Tokyo-to, Japan. As. Prof., Tokyo U. of Foreign Studies. Altaic ling. & Altaic anth., esp. Mongolian ling. Middle Mongolian lang. **A**

P

PAILLARD, JACQUES. Prof. Psychol. Physiol., Fac. des Sci., Place Victor Hugo, Marseille 3, France. Physiol. anth., neurophysiol. Psychophysiol. of dev., differential psychol., neurophysiol.

PAIRAULT, CLAUDE A. 9 rue Raynouard, Paris 16, France. Centre Natl. de la Recherche Sci. Soc. anth., ethnogr. rsc. Soc. anth., sociol. of relig. Central Afr. **F**

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PARK, GEORGE K. As. Prof., Dept. Sociol., Ohio U., Athens, Ohio, U.S.A. Soc. anth., ethnol. Soc. & pol. org., relig. & world-view, ecol. analysis. Sub-Saharan Afr. **F**

PAUKER, GUY J. Ac. Prof. Pol. Sci., Dept. Pol. Sci., U. California, Berkeley 4, Calif., U.S.A. Pol. dev. S. E. Asia. **A**

PECKHAM, STEWART L. Cur. of Collections (Anth.), Mus. of New Mexico, Santa Fe, N.M., U.S.A. Arch. S. W. U.S.A.: architec., settlement & village patterns. **N**

PEETERS, K. C. Tentoonstellingslaan 37, Antwerp, Belgium. Prof., Catholic U., Leuven. Folklore, Museol. **W**

PELZEL, JOHN C. Peabody Mus., Cambridge 38, Mass., U.S.A. Prof., Harvard U. Soc. anth. Soc. org. Far East. **A**

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PORTENGEN, ALBERTA J. Danckertsstr. 9, The Hague, Netherlands. Deputy Headmistress, Maerlant-Lyceum. Cul. anth.

PRIETO, LUIS J. 3 Place de la Gare, Sceaux (Seine), France. Prof. Ling. Gen., U. Cordoba, Argentina; Attaché de Recherches, Centre Natl. de la Recherche Sci., Paris. Gen. ling.

PRINS, A. H. J. "Huis ter Aa," Glimmen (Gr.), Netherlands. Reader in Cul. Anth., U. Groningen, Groningen. Cul. anth., ethnohist. Maritime cul., method, age classes & dual struct., values & themes, labour, modern indigenous pol. dev., hist. Afr. & Mid. E., Indian Ocean. **F**

PRITCHARD, JAMES B. 2451 Ridge Rd., Berkeley 9, Calif., U.S.A. Prof. of Old Testament Lit., Church Divinity Sch. of the Pacific. Arch. Cul. hist. of Ancient

Near East. Palestine, Syria & adjacent regions. **M**

R

RABEL, LILI E. As. Prof. English, Louisiana State U., Baton Rouge 3, La., U.S.A. Descriptive & applied ling. Descriptive grammar of English, German, Khasi (Mon-Khmer), foreign students in U.S. insts.; teaching of foreign langs. & pronunciation. Germany, Austria. **E**

RAHDER, JOHANNES. Prof. Japanese, Tibetan & Mongolian Langs., 307 Hall of Graduate Studies, Yale U., New Haven, Conn., U.S.A. Comp. ling. (all langs. of the world). Origin of Chinese, Japanese, Korean & Ainu lexical items. Asia & islands in the Pacific Ocean. **A**

RAVICZ, ROBERT. 2141 Regent St., Madison, Wis., U.S.A. Instr., Dept. Anth., U. Wisconsin. Ethnol., soc. anth. Soc. org. Latin Amer. **S**

RECASENS I TUSET, JOSE. Transversal 5a No. 47–25, Apt. 201, Bogota, Colombia. Prof. U. Javeriana. Anth., hist., Amer. anth., old world arch. & prehist. **N-S-E**

REY, PAULE-YVONNE. Fav. Pictet de Rochemont, Geneva, Switzerland. Inst. de Physiologie, U. Genève. Industrial psychophysiol. Human probs. in industrial environment. Switzerland. **E**

REYES, FRANCISCO. Coventry 1049, Santiago, Chile. Investigator, Centro de Estudios de la Antr., U. Chile. Soc. anth. Prob. of folk comm., urban groups.

RITZENTHALER, ROBERT. Cur. of Anth., Public Mus., Milwaukee 3, Wisconsin, U.S.A.

ROBINS, FREDERICK W. 4 Harewood Ave., Bournemouth, England. Chrmn., Arch. Section, Bournemouth Nat. Sci. Soc., Mem. de l'Inst. Intn'l. de Sociol. Arch., folklore. Hist. of lighting, water supply, bridges; soc. hist. of hearth, ball, smith, mediaeval guilds, domestic life in all ages. Gen., esp. Eur. **W-E**

S

SADY, RACHEL REESE. 40 Euclid Ave., Hastings-on-Hudson, N.Y., U.S.A. Soc. & applied anth.

SAMAYOA CHINCHILLA, CARLOS. Mus. Arqueologico, Edificio no. 5, La Aurora, Zona 13, Guatemala. Dir. Inst. de Antr. e Historia. Anth., arch., hist.

SASAKI, TOM T. As. Prof., Dept. Sociol., U. New Mexico, Albuquerque, N.M., U.S.A. Applied anth. S. W. U.S.A. **N**

SCANDURA, ANTONIO. Via Messina 25, Rome, Italy. Inst. Intn'l. de Sociol. Ethnol., soc. anth., folklore. N. Afr., Italy. **F-E**

SCHLENTHER, URSULA. Dozent f. Völkerkünde, Humboldt U., Berlin No. 18, Germany. Arch. Mid. & S. Amer. **S**

SCHUETZ, MARDITH K. Cur. of Anth. Witte Mus., Brackenridge Park, San Antonio 9, Tex., U.S.A. Arch. Archaic arch. Archaic arch. of Tex. & its relationships to archaic horizons in N. Amer. & Mexico, early textile techniques, techniques of lithic industries in Tex. **N**

SHARP, ANDREW. Cul. Advisory Officer, Dept. Internal Affairs, P.O.B. 8007, Wellington, New Zealand. Prehist. & early hist. of Oceania, esp. Polynesia. **O**

SHAW, ELLA MARGARET. Ethnol., S. Afr. Mus., Cape Town, S. Afr. Material cul. Crafts. S. Afr., esp. e. Cape Prov. **F**

SHEPARD, ANNA O. 751 11th St., Boulder, Colo., U.S.A. Ac. in Arch., Carnegie Inst. of Washington. Arch. Ceramic technol. analysis, phys. methods of analysis in arch., contemp. pottery making, econ. of ceramic industry. Mesoamer., S. W. U.S.A. **N-S**

SHIPLEY, WILLIAM F. 6128 Hillegass, Oakland 18, Calif., U.S.A. As. Prof., Dept. Ling., U. California, Berkeley. Ling. Genetic relationships of Penutian langs., hist. & descriptive work in Amer. Indian ling. Calif. & N. Amer. langs. **N**

UEYAMA SHUNPEI. 8 Tarumiyama, Uzumasa, Ukyo-ku, Kyoto, Japan. As. Prof. Kyoto U. Theoretical anth. Comp. study of bourgeois revolutions in Eur. & Japan, found. of the scis. of man. **W**

SIMMONS, DONALD. 6 Cassillis Rd., W. Hartford, Conn., U.S.A. Instr., Hartford Branch., U. Connecticut. Efils ethnogr., W. Afr. ethnol., folklore W. Afr. **F**

SIMPSON, RUTH. 840 Fairfield Circle, Pasadena, Calif., U.S.A. As. Cur., Southwest Mus., Los Angeles. Arch., esp. Pleist. & early post-Pleist. Early lithic industries, geol.-arch. associations, typology of lithic material, petroglyphs, comp. studies. Primarily Great Basin, also Amer. deserts. **N**

SIO, ARNOLD. Ac. Prof. Sociol. & Anth., Colgate U., 25 University, Hamilton, N.Y., U.S.A. Cul. anth. Amer. Negro; race & cul. contact; family & kinship; comp. pol. org.; peasant soc. South U.S.A., Brazil. **N-S**

SJOBERG, ANDRÉE F. Box 7940, U. Station, Austin, Tex., U.S.A. After Sept. 1960, Lect. in Ling., U. Texas. Lang. & cul., Dravidian & Turkic ling. Ethnohist. of Central Asia & Southwest U.S.A. **A-N**

SJOBERG, GIDEON. Ac. Prof. Sociol., Dept. Sociol., U. Texas, Austin, Tex., U.S.A. Comp. urbaniz., or comp. urban soc. struct., comp. method, theory of lang.

SMITH, ALLAN. Prof. Anth., Dept. Sociol. & Anth., Washington State U., Pullman, Wash., U.S.A. Ethnol. Micronesia, Ryukyuan Is., N. Amer. plateau. **A-N**

SMITH, ROBERT J. As. Prof., Dept. Sociol. & Anth., Cornell U. Ithaca, N.Y., U.S.A. Soc. anth., accult. studies, peasant socs., indices of change, Japan, Far East. Japan, Far East. **A**

SNYDERMAN, GEORGE S. 8039 Forrest Ave., Philadelphia 50, Pa., U.S.A. Supervisor, Bur. Employment Security. Soc. anth. & ethnohist., management & personnel probs. N. Amer. **N**

SPEISER, E. A. 7601 West Ave., Philadelphia 17, Pa., U.S.A. Chrmn., Oriental Studies, U. Pennsylvania. Cul. hist. of ancient Near East, Assyriology, Bible. Near & Mid. East. **M-A**

SQUIER, ROBERT J. Instr., Dept. Sociol. & Anth., U. Kansas, Lawrence, Kan., U.S.A. Arch., phys. anth. Prehist. of W. N. Amer., mid. Amer. & Old World; fossil man, race. W. N. Amer., mid. Amer., Eur., Afr. **N-S-E-F**

STANKIEWICZ, EDWARD. Ac. Prof., Dept. Slavic Lang. & Lit., Indiana U., Bloomington, Ind., U.S.A. Ling. Ling. typology, lang. of poetry & versification, expressive lang. Slavic. **E**

STEIN, R. A. 1 rue de l'Université, Paris 7, France. Prof., École Pratique des Hautes Études. Philol. Sociol., relig., ling., folklore, ethnol. China, Tibet, Mongolia, Central Asia. **A**

STEVENSON, ROLAND C. P.O.B. 65, Omdurman, Sudan. Educ. missnry., Church Missnry. Soc. Afr. ling. (non-Bantu), soc. anth. esp. Nuba mountains, Kordofan. Afr. langs. n. of Bantu area, esp. Sudan & former Fr. Equatorial Afr., soc. anth. of Nuba mountains, Kordofan. **F**

STIGLER, ROBERT. As. Prof., Dept. Anth., Brandeis U., Waltham, Mass., U.S.A. Arch. Mesolithic, neolithic, early agr., settlement patterns. S. Amer., esp. Peru, Near East, esp. Israel & Iran. **S-M-A**

STOUT, DAVID B. Prof. Anth., Dept. Anth. & Ling., U. Buffalo, Buffalo 14, N.Y., U.S.A. Cul. anth. Art & technol., soc. org. S. Amer. esp. non-Andean. **S**

STREET, JOHN C. Lect. in Mongolian & Ling., 70 Philosophy Hall, Columbia U., New York 27, N.Y., U.S.A. Ling. Mongolian langs., gen. ling. Central Asia (Mongolia & area once conquered by Mongols). **A**

HISASHI SUZUKI. 1 Motofujicho, Bunkyoku, Tokyo, Japan. Prof., Dept. Anth., Tokyo U. Phys. anth. Study of twins, age changes of skeletal characteristics of Japanese, origin of Japanese, diluvial man in Japan. Japan. **A**

JIRO SUZUKI. 144 Matsunoki Juhtaku, 1246 Matsunoki-cho, Suginamiku, Tokyo, Japan. Cul. & soc. anth. Modernization, minority. Japan, Malaya. **A**

SZABÓ, GEORGE. 405 E. 82nd St., 5L, New York 28, N.Y., U.S.A. Rsc. Ac., Kossuth Found., Inc. Arch. Prehist. and medieval mining & metallurgy in Eur. & Amers., arch. of prehist. & medieval settlements in Eur. Eur., esp. Central Eur., Amers. **E-N-S**

T

TAYLOR, DOUGLAS RAE. "Magua," Dominica, B.W.I. Cul. anth., anth. ling. (Arawakan & Creole). Lang., marriage & the family, supernat. beliefs & practices. Caribbean, Guianas. **S**

TENTORI, TULLIO. Piazza Marconi 8, Rome, Italy. Dir., Mus. Tradizioni Popolari. Cul. anth. Theoretical & methodol. prob. in cul. anth; applications of anth. in probs. of modern world; indigenous civs. of New World; field work techniques in contemp. soc. Eur., esp. Italy; Amer. **E-N-S**

TIEDKE, KENNETH E. USOM/Nepal via U.S. Dept. State Mail Room, Washington 25, D.C., U.S.A. Chief Advisor, Village Dev. Ethnol., ethnogr., soc. anth. Cul. change, soc. org., pers. & cul. N. Amer., Middle East, S. Asia. **N-M-A**

TITLBACHOVÁ, SVATAVA. Viničná 7, Prague 2, Czechoslovakia. Lect. Phys. anth. Anth. of sports, methods of identification, esp. hair (criminalistics).

TRAGER, EDITH CROWELL. 27 Chateau Terr. East, Buffalo 26, N.Y., U.S.A. Lect., U. Buffalo. Ling. Applied ling., esp. English, Amer. Indian, lang. & cul. (Kiowa). Russian. N. Amer., Eur. **N-E**

TRIEBELS, LEO FELIX. Prof. Hoogveldstr. 14, Nijmegen, Netherlands. As., Inst. of Cul. Anth., Roman Catholic U. Cul. anth. & ethnol. Cul. anth., ethnol., ethnogr. World-wide, esp. Guiana. **W-S**

TRONIČEK, CHRUDOŠ. Viničná 7, Prague 2, Czechoslovakia. As. of Anth., Inst. of U.

Prague. Phys. anth. Fossil man, prehist. & recent races.

TROUWBORST, ALBERT. Zoeterwoudseweg 102, Leiden, Netherlands. Rijksmus. v. Volkenkunde. Soc. anth. Pol. systems, material cul. Afr. (interlacustrine regions). **F**

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U

UJVARY, ZOLTAN. Neprajzi Intezet, Deprecen 10, Hungary. Rscr., Inst. U. Deprecen. Popular customs. Folklore. **E**

V

VAN BEEK, GUS W. Ac. Cur., Div. of Arch., U.S. Natl. Mus., Smithsonian Inst., Washington 25, D.C., U.S.A. Arch. Arch. cul. dev. & diffusion in ancient Near East & Medit. area; ceramics, principles & techniques of arch. methods. Near East, Medit. area. **E**

VANNICELLI, P. LUIGI. 2 Piazza S. Pietro in Montorio, Rome, Italy. Prof., U. Rome. Ethnol. (soc. anth.) & hist. of religious sociol. Far East & Asia ethnol., comp. hist. of relig., philos. Asia, Far East. **A**

VAN STONE, JAMES W. Lect., Dept. Anth., U. Toronto, Toronto 5, Ont., Canada. Soc. & applied anth. Amer. & Canadian arctic. **ARCTIC**

DE VILLIERS, HERTHA. Lect. in Anat., Anat. Dept., Med. Sch., Hospital St., Johannesburg, S. Afr. Phys. anth., anthropometry, craniology. S. Afr. Bantu-speaking Negro, Bushman, Hottentots, (Afr. Negroes & Bantu speaking Negroes in gen.). **F**

W

WAGLEY, CHARLES W. Prof., Dept. Anth., Columbia U., New York, N.Y., U.S.A. Soc. anth. Soc. org., ethnic &/or minority groups: accult. Latin Amer. **S**

WALLACE, DWIGHT T. As. Prof., Dept. Sociol. & Anth., U. North Carolina, Chapel Hill, N.C., U.S.A. Arch. of S. Amer., Latin Amer. ethn. Latin Amer. **S**

WEINGROD, ALEX. Chisachon 44B Afridar Ashcalon, Israel. Rsc. Dir., Jewish Agency; Lect., Hebrew U., Jerusalem. Soc. anth. Prob. of soc. struct. & cul. change, new comms., Mid. East ethnol., applied anth. Mid. East. **M**

WEINHOLD, RUDOLF. 51 Wisbyer Str., Berlin-Pankow, Germany. Wiss. Oberas. am Inst. für deutsche Volkskunde, an der DAW, Berlin. German folklore, German material folk cul. Eur., Germany. **E**

WESCOTT, ROGER W. Soc. Sci. Dept., Michigan State U., E. Lansing, Mich., U.S.A. Ac. Prof. Ling., soc. theory. Phonemic analysis, comp. ling., hist. langs. W. Afr., esp. w. Nigeria. **F**

WESSEL, BESSIE BLOOM. 57 Marvel Rd., New Haven 15, Conn., U.S.A. Prof. Emeritus Anth., Connecticut Col., New London.

WHEELER, RICHARD P. P.O.B. 1, Mesa Verde Natl. Park, Colo., U.S.A. Mus. Cur. (arch.), Wothorill Mesa Arch. Proj. Arch. Early man in N. Amer., plains arch., s. w. arch. U.S.A. (plains & s. w. areas). **N**

WILBERT, JOHANNES. Aptdo. 681. Caracas, Venezuela. Dir., Dept. Antr., Central U. Venezuela. Cul. anth. Ethnol., soc. struct. Venezuela. **S**

WILS, J. A. F. Huygensweg 4, Nimeguen, Netherlands. Prof. Gen. Ling., U. Nimeguen. Gen. Ling., Afr. & Indonesian langs. Afr., Indonesia. **F-A**

KHIN MAUNG WIN. Lect., Dept. Philos., U. Rangoon, Burma. Philos. Philos. of cul. Burma. **A**

WINANS, EDGAR. Instr., Div. of Soc. Sci., U. California, Riverside, Calif., U.S.A. Cul. anth. Soc. struct., pol., law, kinship. Afr. **F**

WITHERS, CARL. Soc. Sci. Rsc. Analyst, Children's Bur., Dept. of Health, Educ. & Welfare, Washington 25, D.C., U.S.A. Soc. anth, folklore. Comm. studies, Amer. cul., studies of adolescence & youth, children's folklore. U.S.A., Cuba. **N**

WYANT, MARGARET HORSLEY. Ac. Prof. Sociol., Washington Col., Chestertown, Md., U.S.A. Ethnol. Nutrition. Philippines & S. E. Asia. **A-O**

Y

YAMANLAR, ORHAN. I.U. Orman Fakultesi, Buyukdere, Istanbul, Turkey. As. Prof., Fac. of Forestry. Land utilization in relat. to soil conservation. Soil conservation. Mid. East, Turkey. **M**

Z

ZIGMOND, MAURICE L. 140 Dalton Rd., Belmont, Mass., U.S.A. Lect. anth., Yale U. Cul. anth. Ethnobotany, anth. approach to Judaism, anth. of Near East. Near East, S. W. **E**

ZIMMERMAN, BEN. 51 W. 88th St., New York, N.Y., U.S.A. Ed., AMSCO Sch. Publications. Cul. anth. Contemp. Brazil, race relats., cul. change. Afr., S. Amer. **F-S**

ZOLNAI, BÉLA. V. Marcó-utca 7, Budapest III, Hungary. Prof. Emeritus. Ling., lit.

ZUIDEMA, REINER TOM. van Swietenstr. 31, Leiden, Netherlands. Cur., Rijksmus. voor Volkenkunde. Cul. Anth. Soc. org. S. Amer., esp. Peru. **S**

Calendar

1960

July 18–25. 34th Intn'l. Congress of Americanists. Vienna, Austria. Write: Robert Heine-Geldern, Institut für Völkerkunde, Reitschulgasse 2, Vienna I, Austria.

July 24–29. 13th Annual Conference of the Intn'l. Folk Music Council. Vienna, Austria. Write: Miss Maud Karpeles, 35 Princess Court, Queensway, London W.2, England.

July 26–30. 6ème Congrès du Bureau Intn'l. d'Anthropologie Differentielle. Paris, France. Write: B.I.A.D., 42 rue Henri Barbusse, Paris 5, France.

July 30–August 6. 6th Intn'l. Congress of Anthropological and Ethnological Sciences. Paris, France. Write: H. V. Vallois, Director, Musée de l'Homme, Palais de Chaillot, Paris 16, France.

July 31–August 5. Intn'l. Conference on General Semantics. Honolulu, Hawaii, U.S.A. Write: Shunzo Sakamaki, Prof. of History, Univ. of Hawaii, Honolulu, Hawaii, U.S.A.

August 6–13. 19th Intn'l. Geographical Congress. Stockholm, Sweden. Write: I. G. C., Postfack, Stockholm 6, Sweden.

August 10–17. Intn'l. Congress of Orientalists. Moscow, U.S.S.R.

August 17–20. 4th Intn'l. Congress on Archives. Stockholm, Sweden. Write: Ingvar Andersson, Riddargatan 11B, Stockholm Ö, Sweden.

August 21–25. Louvain. **August 26–27.** Brussels. 1st Intn'l. Congress of General Dialectology. Write: Sever Pop, 185 Avenue des Alliés, Louvain, Belgium.

August 21–28. 11th Intn'l. Congress of Historical Sciences. Stockholm, Sweden. Write: Åke Sällström, Riddargatan 11B, Stockholm Ö, Sweden.

September. Intn'l. Congress for General and Applied Phonetics. Hamburg, Germany. Write: Hans-Heinrich Wängler, Laboratory of Phonetics, University of Hamburg, Alsterglacis 3, Hamburg 36, Germany.

September 1–7. 5th Intn'l. Congress on Nutrition. Washington, D.C., U.S.A. Write: I.C.N., 9650 Wisconsin Avenue, N.W., Washington 14, D.C., U.S.A.

September 4–12. Intn'l. Congress of the History of the Discoveries. Lisbon, Portugal. Write: J. Caeiro de Matta, Palácio de S. Bento, Lisbon, Portugal.

September 4–October 1. Regional seminar on "The Museum as a Cultural Center in the Development of the Community." Tokyo, Japan. Write: Hiroshi Daifuku, Museums and Monuments Division, UNESCO, Place de Fontenoy, Paris 7, France.

September 8–18. 17th Intn'l. Congress of the History of Medicine. Athens, Greece. Write: S. Oeconomos, Dean, Faculty of Medicine, National and Capodistrian University of Athens, Odos Panepistimiou, Athens, Greece.

September 10–17. 10th Intn'l. Congress for the History of Religions. Marburg, Germany. Write: C. J. Bleeker, I.A.H.R., 290 Churchill-laan, Amsterdam, Netherlands.

November 17–20. American Anthropological Association. 59th Annual. Minneapolis, Minnesota, U.S.A. Write: Robert Spencer, Dept. of Anthropology, Univ. of Minnesota, Minneapolis, Minn., U.S.A.

December 26–31. American Association for the Advancement of Science. Section H (Anthropology) annual meeting. New York, N.Y., U.S.A. Write: James L. Giddings, Dept. of Sociology and Anthropology, Brown Univ., Providence 12, Rhode Island, U.S.A.

1961

August 21–September 2. Pacific Science Congress. Honolulu, Hawaii, U.S.A. Write: Harold J. Coolidge, Bishop Museum, Honolulu 17, Hawaii, U.S.A.

September. 20th Intn'l. Congress on the History of Art. Copenhagen, Denmark. Write: M. Aubert, 8 Cité Vaneau, Paris 7, France.

September 7–12. 2nd Intn'l. Conference of Human Genetics. Rome, Italy. Write: Istituto "G. Mendel," 5, Piazza Galeno, Rome, Italy.

November 16–18. American Anthropological Association. 60th Annual. Philadelphia, Pennsylvania, U.S.A.

1962

Intn'l. Congress of Prehistoric and Protohistoric Sciences. Rome, Italy. Write: L. Cardinali, % Università degli Studi, Rome, Italy.

9th Intn'l. Congress of Linguists. U.S.A. Write: Miss Chr. Mohrmann, 40 Sint-Annastraat, Nijmegen, Netherlands.

August. Intn'l. Congress of Comparative Law. Hamburg, Germany. Write: F. de Sola Canizares, 1, rue Longpont, Neuilly sur Seine, France.

November 15–17. American Anthropological Association. 61st Annual. Chicago, Illinois, U.S.A.

1963

11th Intn'l. Congress for the History of Religions. India. Write: C. J. Bleecker, 290 Churchill-lann, Amsterdam, Netherlands.

November 21–23. American Anthropological Association. 62nd Annual. San Francisco, California, U.S.A.

Continué du couvert premier intérieur
les commentaires qui n'auront pas fait l'objet d'une demande particulière. Ils seront publiés pour compléter les commentaires prévus par l'auteur ou la rédaction, afin d'élargir le champ de la discussion.

Information diverses et documentation de base

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